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A Study on the effectiveness of cyriax physiotherapy in the management on pain, grip strength and functional disability among patients with lateral epicondylitis

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Abstract

Background: Lateral epicondylitis, commonly known as tennis elbow, is an overuse injury that develops due to repeated strain on the wrist extensor muscles, particularly the extensor carpi radialis brevis (ECRB) tendon at its origin. This repeated overload leads to irritation and inflammation of the tendon. People with this condition usually complain of pain and tenderness on the outer side of the elbow, which becomes worse when gripping, lifting, or carrying object.

Methodology: 20 subjects were included in the study and was treated with Cyriax physiotherapy for 3 times a week for four weeks. The experimental study designed with pre-test and post-test. Numeric Pain Rating Scale to measure pain, Handheld dynamometer to measure Grip strength and PRTEE-Questionnaire to measure functional disability were used as outcome measures.

Result: The calculated paired 't' value of pain, grip strength and functional disability is 9.66, 15.42 and 22.12, the 't' table value is 2.861 at 0.005 level of significance, since the calculated 't' value is more than the 't' table value. Hence the results showed a statistically significant difference in reducing pain and functional disability and improving grip strength following the intervention.

Conclusion: The Statistical results show that there is an effectiveness of Cyriax physiotherapy in improving grip strength and reducing pain and functional disability among patients with lateral epicondylitis.

Keywords: Lateral epicondylitis, Cyriax physiotherapy, Pain, Grip strength, Functional disability, Numeric Pain Rating Scale, Handheld dynamometer, PRTEE-Questionnaire.

Introduction

Lateral epicondylitis is an inflammation of the lateral epicondyle, also commonly known as tennis elbow, which is associated with work or sports-related pain disorder of the extensor muscles of the forearm. The inflammation is caused by the unrestrained, rapid, repeated motions of the forearm and wrist, which ruptures proximal attachment of long extensor muscles of the forearm, such as extensor carpi radialis brevis (ECRB). It can cause constant pain and local inflammation in the elbow and is associated with severe limitation of upper limb function.[1]

The incidence of lateral epicondylitis is 3.4 per 1,000 patients. The condition affects approximately 1% to 3% of the general population, with peak incidence between 45 and 54 years of age. Both genders are equally affected, though individuals using vibrating tools or engaged in high-demand occupations are at greater risk.[2] The overall prevalence of lateral epicondylitis was 12.2% in the general population.[3]

It has well defined clinical presentations, the main complaints being pain and decreased grip strength, which may affect activities of daily living. Diagnosis is simple and can be confirmed by tests that reproduce the pain, such as palpation over the facet of the lateral epicondyle, resisted wrist extension, resisted middle finger extension, and passive wrist flexion.[4]

Numeric Pain Rating scale can be used to identify the intensity of pain. It is one of the basic pain measurement tools which consists of 10cm horizontal line with two end points labelled respectively. The patient rates pain on a scale from 0 to 10, where 0 is no pain and 10 is severe, disabling pain.[5]

The Patient-Rated Tennis Elbow Evaluation Questionnaire (PRTEE) is a 15-item self-reported questionnaire to measure perceived pain and disability in people with tennis elbow. It has three subscales: pain, usual activities and specific activities. Each of the items of the PRTEE is scored on a 0-10 scale, where 0 is 'no pain' or 'no difficulty' and 10 is 'worst ever' or 'unable to do'. The total score ranges from 0 to 100, where high scores indicate greater pain and disability.[6]

Handheld dynamometers are commonly used to assess grip strength in patients with lateral epicondylitis. During the test, the patient is asked to squeeze the devices as hard as possible for about three seconds. This is repeated three times, and the average of the three readings is recorded in pounds.[7]

Conventional treatment for tennis elbow has focused primarily on the management of pain by anti-inflammatory medication, ultrasound, phonophoresis or iontophoresis. Various treatments have been attempted for tennis elbow including corticosteroid injection, drug therapies, laser, electrical stimulation, ergonomics, strengthening exercise, acupuncture and splintage. Surgical treatment is indicated in 5-10% of patients who did not improve from their symptoms with conservative treatment.[8]

Cyriax method is combination of deep friction massage and mill's manipulation. Deep friction massage is a type of connective tissue massage applied precisely to soft tissue structures such as tendons. Mill's manipulation is defined as a passive movement performed at the end range, that is once all the slack has been taken up and is minimal amplitude, high velocity thrust.[9]

Methodology

The review board of RVS college of Physiotherapy, Coimbatore, approved this pre-test and post-test experimental study. 20 selected subjects with lateral epicondylitis were recruited through purposive sampling based on specific inclusion and exclusion criteria, and the study was conducted over a period of four weeks.

Measurement Procedure:

Numeric Pain Rating Scale:

The numeric pain rating scale used to assess the pain intensity. It consists of 10cm horizontal scale with point labelled pain 0 (no pain) and 10 (most severe pain). The measurement is based on self-report. During the visit, patients were asked to rate their pain by placing a mark on the corresponding line from 0 to 10.

Handheld dynamometer:

Grip strength was measured using a handheld dynamometer with a comfortable and suitable hand grip size. The patient positioned with the elbow should be kept at 90° and the forearm should be in neutral position. Ask the patient to squeeze as hard as possible to get one brief maximal contraction for 2-5 seconds. Record the peak force value displayed on the device. Repeat the measurement 3-5 times, allowing 30-60 seconds of rest between trials. To measure the strength patient squeezed the dynamometer as much as possible.

Patient Rated Tennis Elbow Evaluation (PRTEE) questionnaire:

The PRTEEQ was a subjective measure which contains 15 items that assess two domains; 5 items subscale that measure pain and 10 items subscale that measure disability. The patient was allowed to rate their levels of pain and disability from 0 to 10 in the questionnaire.

Treatment Procedure:

Cyriax physiotherapy:

Patient position: Sitting position

Therapist position: Standing on the affected side of the patient

Procedure: The treatment consists of 10 minutes of deep transverse friction massage (DTFM) immediately followed by a single application of Mill's manipulation. Deep transverse friction for tennis elbow is applied as follows. The patient should be positioned comfortably with the elbow fully supinated and in 90° of flexion. After palpating the anterolateral aspect of the lateral epicondyle of humerus, the area of tenderness was mapped. Deep transverse friction is applied with the side of the thumb tip. The pressure applied in a posterior direction on the Teno osseous junction. It was applied ten minutes after the numbing effect has been attained, to prepare the tendon for Mill's manipulation. For the technique of Mill's manipulation, patients were positioned comfortably in the sitting position with the affected extremity in 90° of abduction with internal rotation enough so that the olecranon faced up. The therapist stabilized the patient's wrist in full flexion and pronation with one hand, while other hand was placed over the olecranon. While assuming full wrist flexion and pronation position, the therapist should apply a high-velocity low amplitude thrust at the end range of elbow extension.

Treatment duration: Ten minutes

Dosage: 3 times a week for 4 weeks for a total of 12 treatment sessions.

Figure 1: Deep Transverse Friction Massage

Figure 2: Mill's Manipulation

Data Analysis and Results

The study was conducted to determine the effectiveness of Cyriax physiotherapy in reducing pain and improving grip strength and functional performance among subjects with lateral epicondylitis.

Measurement	Mean	Mean difference	Standard deviation	Paired 't' value
Pre-test	6.4	2.65	1.22	9.66*
Post-test	3.75			

Table 1: Mean value, mean difference, standard deviation and paired 't' value between pre and post test scores for pain.

*0.005 level of significance.

The calculated paired 't' value for pain is 9.66 and the 't' table value is 3.17 at 0.005 level of significance. Since the calculated 't' value is more than the 't' table value, there is significant difference in pain following Cyriax physiotherapy among lateral epicondylitis subjects.

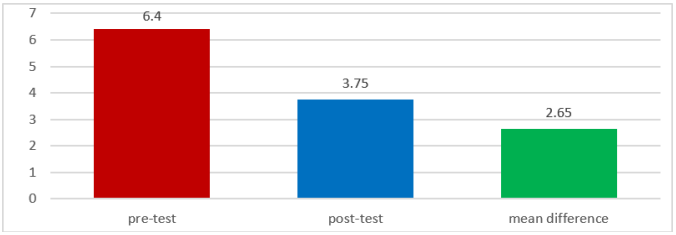

Figure 3: Graphical representation of pre-test and post-test mean and mean difference values of pain.

Measurement	Mean	Mean difference	Standard deviation	Paired 't' value
Pre-test	32.2	26.9	7.79	15.42*
Post-test	59.1			

Table 2: Mean value, mean difference, standard deviation and paired 't' value between pre and post test scores for grip strength.

*0.005 level of significance.

The calculated paired 't' value for grip strength is 15.42 and the 't' table value is 3.17 at 0.005 level of significance. Since the calculated 't' value is more than the 't' table value, there is significant difference in grip strength following Cyriax physiotherapy among lateral epicondylitis subjects

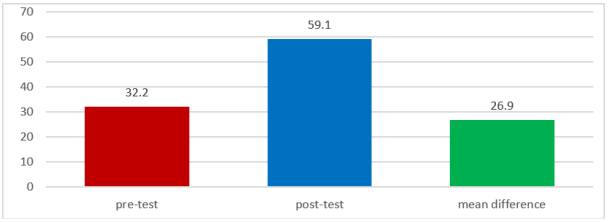

Figure 4: Graphical representation of pre-test and post-test mean and mean difference values of grip strength.

Measurement	Mean	Mean difference	Standard deviation	Paired 't' value
Pre-test	69.35	29.8	6.02	22.12*
Post-test	39.55			

Table 3: Mean value, mean difference, standard deviation and paired 't' value between pre and post test scores for functional disability.

*0.005 level of significance.

The calculated paired 't' value for functional disability is 22.12 and the 't' table value is 3.17 at 0.005 level of significance. Since the calculated 't' value is more than the 't' table value, there is significant difference in functional disability following Cyriax physiotherapy among lateral epicondylitis subjects.

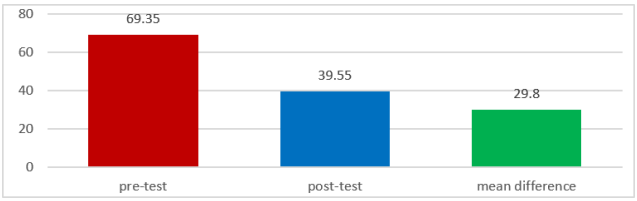

Figure 5: Graphical representation of pre-test and post-test mean and mean difference values of functional disability.

Results

The statistical findings suggested that Cyriax physiotherapy produced significant positive outcomes in individuals with lateral epicondylitis. A decrease in pain intensity was observed with a t-value of 9.66. Similarly, grip strength showed a significant improvement with a t-value of 15.42 and functional performance showed a improvement with a t-value of 22.12. Overall, the results exceeded the critical value of 3.17 at 0.005 significance level, indicating the effectiveness of the intervention.

Discussion

The aim of the study was to find out the effectiveness of Cyriax physiotherapy in the management of pain, grip strength and functional disability among patients with lateral epicondylitis. Twenty lateral epicondylitis subjects were selected, who fulfill the inclusion and exclusion criteria for the study and the subjects were treated with Cyriax physiotherapy for a period of 4 weeks. Pain, grip strength and functional disability were measured by Numeric pain rating scale, Handheld dynamometer and Patient Rated tennis elbow evaluation questionnaire, respectively before and after the treatment.

In the present study the researcher observed that Cyriax physiotherapy is effective in reducing pain and improving grip strength and functional performance among lateral epicondylitis subjects. This was supported by the study, to find out the effect of Cyriax physiotherapy and mobilization with movement technique in reducing pain and improving grip strength in the patients having tennis elbow. 30 patients were included for this study and were randomly divided into group A and group B. Group A(n=15) was treated using Cyriax physiotherapy, group B (n=15) was treated with movement mobilization. Patients were treated 3 times a week for 4 weeks. Outcome measures are NPRS and DASH. Results showed significant improvement in NPRS and DASH in Group A than Group B. From the result it is concluded that Cyriax physiotherapy is more effective in relieving pain and functional disability and improving grip strength than the mobilization with movement in patient having lateral epicondylitis.[10]

The mechanism of Cyriax physiotherapy on lateral epicondylitis is to break down adhesions, facilitate tendon healing, improve tendon gliding and promote circulation. Hence applying the above concepts and support, it can be justified that Cyriax physiotherapy makes a definite difference in reducing pain and improving grip strength and functional performance among subjects with lateral epicondylitis.

Conclusion

The study was conducted to find out the effectiveness of Cyriax physiotherapy on pain, grip strength and functional disability among patients with lateral epicondylitis.

20 subjects were included in the study and were treated with Cyriax

physiotherapy. Before and after completion of 4 weeks treatment the pain, grip strength and functional disability were assessed by Numeric Pain Rating Scale, Handheld dynamometer and Patient Rated Tennis Elbow Evaluation Questionnaire.

Statistical results show that there is an effectiveness of Cyriax physiotherapy in reducing pain and improving grip strength and functional performance among patients with lateral epicondylitis.

Limitations:

- Limited age group
- Short term study
- Stage of Lateral epicondylitis is not specific

Suggestions:

- Similar study can be carried out for larger sample size
- Study can be carried out in different age groups
- Study can be carried out for longer duration.

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