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Comparison of effectiveness of cyriax physiotherapy and mobilization with movement technique in patients with tennis elbow

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Abstract

Background: Pain over the lateral epicondyle, which is exacerbation by work or recreational activities that involves gripping action of the hand, such as holding tools, shaking hands, and lifting a kettle, usually signals that the individuals has a condition termed lateral epicondylitis, or tennis elbow. Deep friction massage, Mobilization with movement of wrist is capable of relieving symptoms in lateral epicondylitis patients.

Objectives: The purpose of the present study is to compare the effect of Cyriax physiotherapy and mobilization with movement technique in reducing pain and improving grip strength in the patients having tennis elbow.

Methods: Study included 30 patients with lateral epicondylitis between ages 30-50 years. The subjects were randomly divided into 2 groups: Group-A and Group-B. Group A (n = 15) was treated using cyriax physiotherapy, group B (n = 15) was treated with movement with mobilization. Patients were treated for 3 times a week for 4 weeks. Outcome measures are NPRS (Numeric Pain Rating Scale) and DASH (The Disabilities of the Arm, Shoulder and Hand).

Result: Results showed significant improvement in NPRS and DASH in Group A (Experimental group) than Group B. Comparison of Group A and Group B was done with independent t-test. Group A showed significant improvement in NPRS (p=0.024) and DASH (p= 0.002).

Conclusion: From the result it is concluded that cyriax physiotherapy is more effective in relieving pain, improving functional disability and improving pain free grip strength than the mobilization with movement in patients having lateral epicondylitis.

Keywords: Cyriax, DASH, Lateral epicondylitis, Mobilization, NPRS

Introduction

Tennis elbow or lateral epicondylitis is one of the most common medical problem of the arm due to a degenerative or failed healing tendon response characterized by the increased fibroblasts, vascular hyperplasia and disorganized collagen in extensor muscles that originate on the lateral epicondylar region of the distal humerus. Tendon of the extensor carpi radialis brevis (ECRB) is the most commonly affected structure [1].

Tennis elbow is an overuse injury [2]. Generally it is a work or sport related pain disorder with macroscopic and microscopic tears usually caused by excessive quick, monotonous, repetitive eccentric contractions and gripping activities of the wrist and forearm. These quick movements can rupture the proximal attachment of the long extensor muscles and cause local inflammation and pain [3]. Pain felt by direct palpation over the lateral epicondylar region of the elbow joint and pain and weakness with gripping activities which affect activities of daily living [4]. Activities that use the muscles that extend the wrist (e.g. pouring a pitcher or gallon of milk, lifting with the palm down) are characteristically painful and Morning stiffness usually present [5].

The dominant arm is commonly affected, with a prevalence of 1–3% in the general population, but this increases to 19% at 30–60 years of age and appears to be more long standing and severe in women [6]. It is related to physical workplace factors among males and females to combination of high levels of physical work and low social support [7].

High physical strain at work or being employed in jobs with manual tasks seems to act as negative prognostic factor at long term^[8].

Tennis elbow is difficult to treat, prone to recurrence may last for several weeks or months and hence this injury is major challenge for the physicians^[1]. Conservative treatment program for people with lateral epicondylitis have focused primarily on the pain control^[9]. A wide range of physiotherapy interventions is used for treating lateral epicondylitis which consists of electrotherapeutic modalities, exercise programmes, soft tissue manipulation, and manual techniques like cyriax. These treatments have different mechanisms of action, but have the same aim to reduce pain and improve function^[10]. Even though various treatments exist in the management of tennis elbow, optimal treatment strategy is not known. Hence, further research is necessary to find the most effective treatment option in the management of patients with tennis elbow^[11]. Cyriax and Cyriax suggested the use of deep transverse friction massage in combination with mill's manipulation for the treatment of tennis elbow^[12]. However, the number of research studies analysing the effectiveness of this treatment intervention is less, the reason being that most of them do not have proper randomization, blinded outcome measures, and accurate functional outcome questionnaires^[13-15].

For the above-mentioned reasons, further research is warranted to find out the effectiveness of Cyriax physiotherapy intervention. Therefore the objective of our study is to compare the effect of cyriax physiotherapy and mobilization with movement technique for the treatment of tennis elbow.

Materials and methods

An experimental study was conducted to find the effects of Cyriax Physiotherapy and Mobilization with Movement technique for the treatment of Tennis Elbow.

Nature of the study: The nature of present study was a comparative study with random sampling.

Sampling method: The method of sampling was random sampling. A total of 30 subjects diagnosed with tennis elbow between the age group of 30-50 years were screened and recruited for the study. We determined the total random sample of n=30, [Group A, n=15 (Experimental Group); Group B, n=15 (Control Group)], considering the following Inclusion Criteria;

1. Patient diagnosed with tennis elbow.
2. Both males and females are included.
3. Patients within age group of 30-50 years.
4. Pain with gripping activities.
5. Pain with resisted wrist extension.
6. Pain with passive wrist flexion with the elbow extension.
7. Tenderness on palpation over the lateral epicondyle of humerus.
8. Duration of symptoms between 8 and 10 weeks.

Patients were excluded if they had

1. Cardiovascular and neurological disease
2. Aversion to manual contact
3. Previous trauma or surgery to the elbow region
4. Peripheral nerve entrapment
5. Cervical radiculopathy.
6. Corticosteroid injection within 6 months

Before the commencement of study, each subject included in the study was given information about the study and attaining their interest, a written consent was signed from every participant. All 30 patients were divided into 2 groups- Group A (n=15) and Group B (n=15). All baseline information was obtained before randomization. Subjects were allocated to two groups by sequential allocation. For example, the first patient was assigned to the cyriax group, the second patient to the movement with mobilization group, and so on. All patients were instructed to use their arm during the course of the study but to avoid activities that irritated the elbow such as shaking hands, grasping, lifting, knitting, handwriting, driving a car, and using a screwdriver. They were also told to refrain from taking anti-inflammatory drugs throughout the course of study. Patient compliance with this request was monitored using a treatment diary.

Treatment Protocol

The protocol for Group A; Cyriax approach: Patients in Group A received Cyriax physiotherapy, which consists of 10 minutes of deep transverse friction massage immediately followed by a single application of Mill's manipulation. Deep transverse friction for tennis elbow is applied. 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 was applied in a posterior direction on the tenoosseous junction. It was applied for ten minutes after the numbing effect has been attained, to prepare the tendon for Mill's manipulation. For the technique of Mills manipulation, patients were positioned comfortably in the seating 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. All participants were seen 3 times a week for 4 weeks for a total of 12 treatment sessions.

A. The protocol for Group B; Movement with mobilization: patients of group B receive movement with mobilization of elbow for 3 sessions spaced at least 48 hours always in a similar climate, place and time. The technique we used was ; The therapist applies a lateral glide as the accessory movement while the patient performs a gripping task using the dynamometer keeping it for 6 sec and repeating the technique for 10 times.

B. Outcome Measure: Following are the outcome measures

1. NPRS (Numeric Pain Rating Scale)
2. DASH (The Disabilities of the Arm, Shoulder and Hand)

Result

Statistical analysis was carried out for two clinical parameters of this study such as NPRS score and DASH questionnaire. Data analysis was performed by using SPSS software.

Table 1: Mean Frequency value of Male and Female Age (in years) in Group A and B.

	Mean of age (in years)	
	Male	Female
Group A	43	39
Group B	46	37

Table 1 Shows mean age of male and female patients of Group A and Group B. Mean Age of the male and female subjects of Group A is 43 and 39 respectively and Mean Age of the male and female subjects of Group B is 46 and 37 respectively.

Table 2: Mean Frequency value and standard deviation of total subjects Age in Group A and B.

	Mean	SD
Group A	40	6.1
Group B	40.5	5.2

Table 2 Shows demographic detail of the patients of Group A and Group B. Mean Age of the subjects of Group A is 40 ± 6.1 and Group B is 40.5 ± 5.2 respectively.

Table 3: Mean and SD of NPRS at pre and post for the subject of Group A and B.

	NPRS (cm)	
	Pre	Post
Mean \pm SD Group A (n=15)	7.8 \pm 0.74	2.5 \pm 0.51
Mean \pm SD Group B (n=15)	7.9 \pm 0.7	3.5 \pm 0.83
t- value	0.252	3.949
p- value	0.638	0.024

Table 3- shows that the pre and post mean value and SD of NPRS of group A were 7.8 ± 0.74 and 2.5 ± 0.51 respectively. For Group B, pre and post mean value and SD of NPRS were 7.9 ± 0.7 and 3.5 ± 0.83 , respectively. Comparisons of NPRS mean value at pre and post between Group A and Group B, showed that the t value of pre and post was 0.252 and 3.949 respectively. It revealed that cyriax is more effective than MWM.

Table 4: Mean and SD of DASH at pre and post for the subject of Group A and B.

	DASH	
	Pre	Post
Mean \pm SD Group A (n=15)	69.76 \pm 5.209	16 \pm 3.105
Mean \pm SD Group B (n=15)	69.3 \pm 5.017	19.5 \pm 1.69
t- value	0.25	0.548
p- value	0.748	0.002

Table 4- shows that the pre –and post –mean value and SD of DASH of group A were 69.76 ± 5.209 and 16 ± 3.105 respectively. For group B, pre and post mean value and SD of DASH were 69.3 ± 5.017 and 19.5 ± 1.69 respectively. Comparison of DASH mean value at pre and post between group A and group B showed that t value of pre and post was 0.25 and 0.548 respectively.

Discussion

Tennis elbow or lateral epicondylitis is described as an overuse injury where the ability of the tendon to repair itself becomes overwhelmed. It was suggested that tissue experiencing lower strain levels, predisposes specific regions of the tendon to structural weakening. This leads to hampering the individual's daily living activities. The characteristic of tennis elbow is the pain present on direct palpation over the lateral epicondyle and with gripping activities [2]. In the present study pain is measure by NPRS and functional disability by DASH questionnaire.

The results of present study showed that Patients of Group A; which were treated by the cyriax physiotherapy treatment showed more improvement in pain and functional status than

the patients of Group B which were treated by mobilization with movement.

According to Thakare PS *et al.* (2014) significant long term effect with greater percentage of improvement in pain and functional ability by cyriax physiotherapy with supervised exercise program in the subjects with tennis elbow [16]. Prabhakar AJ *et al.* (2013) also provided evidence to support the use of Cyriax physiotherapy in relieving pain, improving grip strength and functional performance in subject with tennis elbow [17]. Amit V Nagrale *et al.* (2009) in his study between Cyriax and phonophoresis found Cyriax physiotherapy to be superior treatment approach compared to phonophoresis in terms of pain, pain-free grip, and functional status [18].

On the other hand viswas R *et al.*, (2012) in his study found that supervised exercise program for 4 weeks showed significantly greater improvement in reduction of pain and functional status than the Cyriax physiotherapy treatment [11]. and Anap DB *et al.* (2012) found that Mobilization with Movement (MWM) along with ultrasound, deep friction massage, stretching and strengthening exercise is beneficial for tennis elbow patients [19]. This result is also supported by Patel N (2013) he also found that there is significant improvement in pain and functional status in mobilization with movement group than wrist manipulation. The advantage of MWM of elbow is that it is effective within short period. It also improves the ability of patients to maintain their daily activities without restriction [20]. A number of studies have attempted to compare the effect of MWM other forms of interventions. Geetu and Deepak (2008) found that MWM led to statistically significant improvement in strength and functional performance when compared with US treatment [21]. And Amro Akram (2010) found that MWM and taping techniques resulted in better outcomes than traditional physiotherapy treatment alone [22]. Devdeep Ahuja (2010) in his review study found that movement with mobilization is effective to immediate reduction in pain and improvement in function in patient with tennis elbow [23].

In the present study Movement with mobilization (MWM) intervention is compare with cyriax physiotherapy in tennis elbow patient and it is found that cyriax physiotherapy is more effective to reduce the pain and improve the strength in tennis elbow patients. Effectiveness of cyriax physiotherapy in tennis elbow patients is also supported by Stasinopoulos D (2004) he also found that the cyriax physiotherapy is effective in tennis elbow patients [1]. Although Cyriax physiotherapy is commonly used in the treatment of tennis elbow, more research is needed to assess the long term effect of intervention in patients with tennis elbow.

Conclusion

In the present study on the basis of result analysis it is concluded that cyriax physiotherapy treatment is more effective in relieving pain, improving functional disability and improving pain free maximal grip strength than mobilization with movement in the patients having tennis elbow.

Conflict of Interests: The authors declare that there is no conflict of interests.

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