# A Comparative study to Evaluate the Efficacy of Supervised Exercise Program and Cyriax Physiotherapy on Pain and Function in Lateral Epicondylitis

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## Abstract

**Background:** Lateral epicondylitis is a musculotendinous degenerative disease of the extensors origin that occurs at the humerus lateral epicondyle. Various methodologies of treatment are utilized in the board of lateral epicondylitis.

**Objectives**: The study will investigate the efficacy of the supervised exercise programme and cyriax physiotherapy on the refinement of pain and the functional within Lateral epicondylitis patients.

**Methods**: Participants (n=30) with Lateral Epicondylitis (tennis elbow) shall be recruited to participate in a comparative experimental study. Subjects will be randomized 1:1 to either (1) Supervised Exercise Programme group, or (2) Cyriax Physiotherapy group. Over a 4-week time period, a 3 times in week for the total of 12 sessions, subjects in supervised exercise programme group will receive the Extensor Carpi Radialis Brevis muscle's static stretching along with the wrist extensor's eccentric strengthening and Ultrasound. While those in group of cyriax physiotherapy will receive transverse deep friction massage for the time of 10 min instantly amid by Mill's manipulation/manoeuvre and Ultrasound. The study will be conclude at the 4 weeks.

**Discussion:** Effectiveness of the interventions on the pain and the functional improvement will be assessed by VAS (visual analogue scale) and the Tennis Elbow Function Scale (TEFS) respectively. The findings of the study will greatly contribute for the evidence on the utilization of the supervised exercise programme and therefore the cyriax physiotherapy in tennis elbow condition.

Conclusion: After the statistical analysis of the results, final statements regarding the conclusion of which treatment approaches is effective will be made.

***Keywords****: Cyriax Physiotherapy, Supervised Exercise Programme, Lateral Epicondylitis, VAS, TEFS.*

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## Introduction

The disorder essentially inside the radio humeral joint with constant impairing pain within the elbow, is named as tendonitis, tennis elbow, lateral epicondyalgia or lateral epicondylitis[1]. The precise explanation for tendonitis isn't however identified. It is quite common in people whose jobs demand recurring

forearm movements (e.g., court game sportsmen and woodworkers)[2]. It's normally because of additional fast, wearisome, recurrent eccentric contractions and gliding joint griping activities. It normally affects dominant arm. The typical amount of associate degree episode of epicondylitis in span of six months and two years. In tennis elbow macroscopic and microscopic lesions appears within the muscle named Extensor Carpi Radialis Brevis (ECRB)[3,4]. The absence of acute inflammatory cells in the pathological excision of ECRB tendons suggests that lateral epicondylitis is not a foremost inflammatory disorder. Instead, immature fibroblasts and disorganised, nonfunctional vascular elements have invaded the tissue. Angiofibroblastic hyperplasia was invented by Nirschl and Pettrone to characterise this granulation-like tissue[5,6]. The radial recurrent artery was established by Schneberger and Masquelet as the dominant vascular supply to the ECRB tendon[7,8]. Two hypovascular zones were discovered after further investigation: the first 2--3cm away from the extensor muscle insertion and the second on the lateral epicondyle. A common cause of lateral epicondylitis is repetitive microtrauma from ovework of the wrist extensor muscles. A propitous and not proven cause of lateral epicondylitis is microtrauma in the context of hypovascularity, which prevents healing[9].

The primary complaints in lateral epicondylitis includes lessened strength in grip, inflated pain and reduced functional activity. The diagnosis established by the examination which might evoke the pain, on the lateral epicondylar facet, tenderness on palpation, resisted extension of finger, resisted extension of the wrist joint, and wrist joint flexion passive in nature (cozen's test)[10]. Although various studies are directed on this clinical condition treatment, until now the foremost effectual management plan isn't in agreement whether or not it's standard or surgical. Since lateral epicondylitis is a clinical condition, radiological testing is rarely necessary and reserved for those who do not improve. X-ray is the first line of inquiry when there is a suggestion of radio-capitellar osteoarthritis or other bony pathology[11].

The treatment methods used in medicinal orthopaedic are largely dependent over the kind of condition, cyriax includes manipulations and deep friction massage. Techniques of manipulation (small-amplitude, rapid and passive movement with thrust, also called "C grade mobilisation") are accustomed to reduce tiny gristly displaced particles in the spine in joints of periphery (slack objects). Manipulation is often requited to reinstate usual movability in a joint that has been limited by ligamentous adhesion or when bones have become subluxed. Deep friction is an effective treatment for soft tissue lesions caused by trauma or overuse. The logic for incorporating deep friction (a form of soft tissue mobilisation) is backed up by decades of research that confirms and explains the positive effect of movement on muscle and skeletal tissues healing.[12] Supervised exercise program comprehensive of static stretching with eccentric strengthening where, Static stretching is described as slowly placing the muscle tendon unit in a maximum stretch and keeping it there for an expanded period of time. The optimum position of stretching is evaluated by the patient's mild discomfort and/or pain. It is difficult to activate the stretch reflex, which induces contraction of the muscle tendon unit rather than relaxation, when static stretching is done slowly. Furthermore, since the viscoelastic structure of muscle tendon unit that elongates, the muscle tendon unit's resistance is low in slow static stretching than in fast static stretching. Only the harmed tendon, not all tendons around the skeletal field, should be stretched with static stretching exercises, according to therapists.[13]

## Methods/Design

### Aim

To evaluate the efficacy of the Supervised Exercise Programme and therefore the Cyriax Physiotherapy on pain and functional improvement in tennis elbow.

**Study setting:**

This study will be carried out in the Musculoskeletal Physiotherapy OPD of Ravi Nair Physiotherapy College, Sawangi (Meghe), Wardha, after approval from Institutional Ethics Committee of Datta Meghe Institute Of Medical Sciences, Deemed to be University. Before inclusion, all the participants will be informed regarding the aim and procedure of research. Those participants who will meet the inclusion criteria must give the written informed consent. In a comparative study, the participants (N=30) diagnosed with lateral epicondylitis (LE) will be enrolled for 4 weeks[14]. Fig. 1. Show's the flow chart of the study.

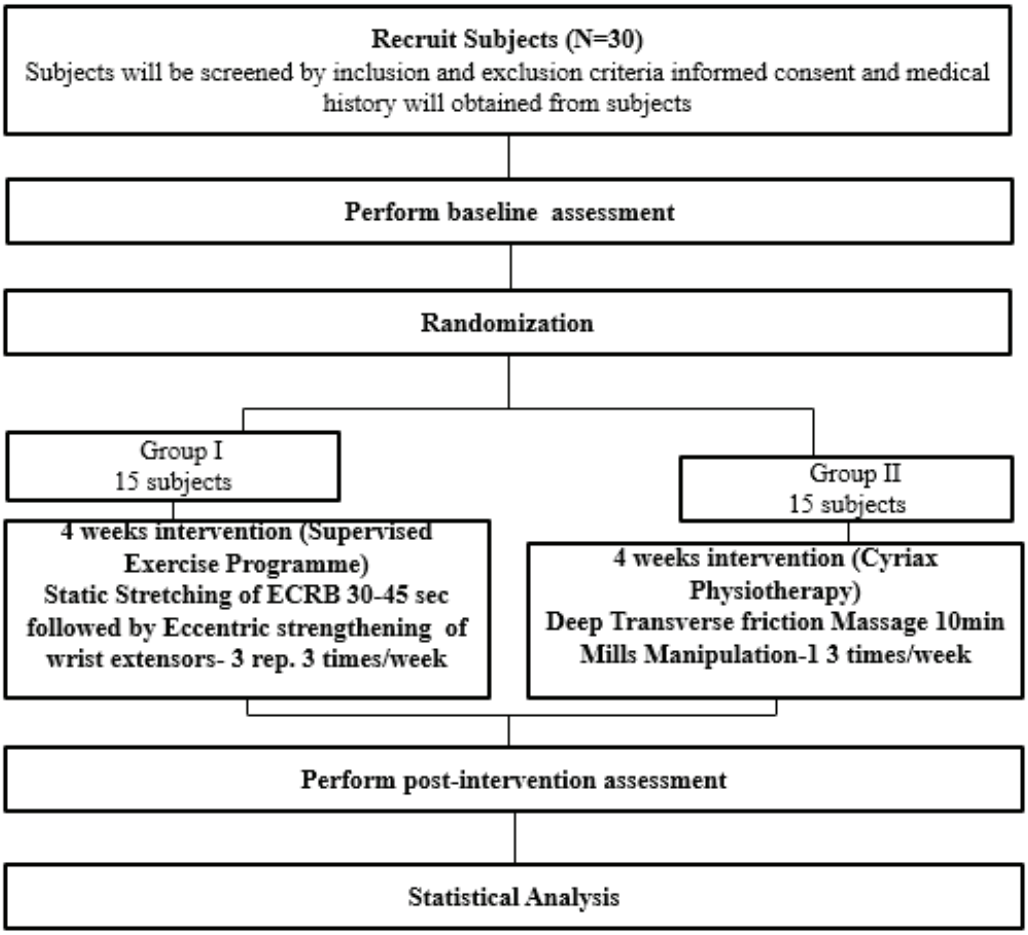


**Fig. 1: Study plan**

**TRIAL DESIGN:**

A comparative study in which the patients will be randomized into two group independent design. Group I will be Supervised Exercise Programme group and Group II will be assigned with Cyriax physiotherapy which basically includes Deep Fraction Massage and Mill's manipulation.

**PARTICIPANTS:**

Based on the criteria of inclusion and exclusion participants will be involved in the study. The subjects in the 20-50 years of age group of both the genders will be included. Subjects who are going to be having pain on passive wrist flexion with the elbow extension also with wrist pain on resisted extension incorporated in study[15]. Also the participants with chronic lateral

epicondylitis and will be having tenderness on the lateral epicondyle of humerus on palpation will be encompassed.

Subjects who will be having cervical radiculopathy, neurological impairments, any preceding trauma to elbow region, any surgeries to elbow region and elbow pain acquired from any other pathology than tennis elbow (lateral epicondylitis) will be eliminated from the study. The subjects who are getting to be having neuromuscular diseases, peripheral nervous disorder and any of them who are getting to be receiving corticosteroid injection in previous 6 months before the study period begins, will not be considered in to avoid further complications.

PARTICIPANT TIMELINE:

Each patient will be required to complete 4 weeks of interventions like supervised exercise programme and cyriax physiotherapy after enrolment in the study.

**Recruitment:**

The patients who are already undergoing rehabilitation in our IPD or coming to the physiotherapy OPD and diagnosed with lateral epicondylitis will be systematically assessed for the eligibility in the study according to the criteria of inclusion and exclusion. After fulfilling the eligibility criteria for their enrollment in the study, the informed patient consent will be cumulated taken after elaborating the purpose and procedure of the study.

SAMPLE SIZE CONSIDERATION:

This comparative study is an experimental two-group design that examines efficacy of the two interventions – the supervised exercise programme and physiotherapy of cyriax in lateral epicondylitis (tennis elbow) treatment[16]. 30 participants will be enrolled to the group I and group II and will be randomized by cheat method.

INTERVENTION DESIGN:

**Group I - Supervised Exercise Programme**

All the participants of administered supervised exercise programme will undergo static stretching of Extensor Carpi Radialis Brevis (ECRB) in a flash followed by the wrist extensors eccentric strengthening. The position of the steady stretch will be held for 30-45 seconds, this intervention will be carried out 3 counts prior and 3 counts after the segment of strengthening eccentric in nature treatment for 6 repetitions in total[17]. In each repetition of stretching there will be 30 seconds of interim. After the manual treatment there will be 5 min application of therapeutic ultrasound with parameters of1MHz frequency, 1:4 ratio of pulsed mode with 0.8 W/cm$^2$ intensity.[18]

Group II – Cyriax Physiotherapy

All the participants will get Cyriax physiotherapy that involves transverse deep friction massage for ten minute which will be straight away accompanied by Mill's manipulation/ manoeuvre. With the side of the fingertip of the thumb on the area of tenderness after palpating the anterior and lateral side of the lateral epicondylar surface of the humerus transverse deep friction massage will be applied. After achieving the effect of numbing, the tendon is made ready for Mill's manipulation. Manoeuvre of Mill's is thrust of a low in amplitude and high in velocity in the end range of elbow extension. It will be single application[19]. With therapeutic ultrasound parameters as above for 5 min.

OUTCOME MEASURES:

1) Visual Analogue Scale - VAS will evaluate the pain, in which is a horizontal bar of 10 cm with two ends zero cm is a 'minimum imaginable pain" and ten cm "worst pain imaginable". Patient will have to draw out a upright line on the horizontal scale according to their present level of pain.

2) Tennis Elbow Function Scale (TEFS) – The Functional activity of elbow will be evaluated on Tennis Elbow function Scale which have ten group of activities and their rating will be based on discomfort i.e. 'No discomfort' to 'Extreme discomfort'. This

scale is scores in relation with VAS in combination for pain related function.

**Data Collection and Management:**

The assessment data will be collected from a predetermined spreadsheet with the baseline characteristics variable. The hard copies of assessment forms and signed consent forms will be stored securely at the study site. Data collection and documentation will be done under the guidance of the principal investigators. The study documentation will be evaluated thoroughly for accuracy.

## Statistical Analysis

To perform the comparison between the two groups, t-tests will be used for the demographic measures and initial scores on outcome measures. For the interpretation of the results, we will significant differences. Significance will be set at P less than 0.05. Data will be coded and entered in MS excel worksheet and analysed using appropriate statistical software.

## Discussion

The study is aimed at assessing the efficacy on pain and functional improvement of the interventions like cyriax physiotherapy and supervised exercise programme with therapeutic ultrasound in lateral epicondylitis (tennis elbow)[20,21]. Earlier studies have proved that both these interventions are beneficial in pain reduction and function improvement[22]. But amongst the two which one is more better and well tolerated by the patients is not known. Also above mentioned each intervention along with therapeutic ultrasound not yet performed in any studies published till now. Henceforth which intervention amongst the two will be helpful for the patients of lateral epicondyalgia is the main aim of this research.

To conclude we aim at finding out improvement in pain and the functional efficacy through supervised exercise programme and cyriax physiotherapy on lateral epicondylitis. Hence which intervention is more beneficial on these outcome measures is to be analysed.

**Ethics and Dissemination:**

The ethical clearance will be obtained from Institutional Ethics Committee of Datta Meghe Institute of Medical Sciences, Deemed to be University. The main findings regarding the efficacy of the Supervised exercise program and Cyriax physiotherapy in patients with Lateral Epicondylitis on pain and function will be published in a peer-reviewed journal.

**Patient Consent:** The informed consent will be obtained from the patient on a printed form with signatures and give the proof of confidentiality.

**Author's contribution:** The study was created and designed by all of the authors, and the final manuscript was approved for publication by all of them.

**Declaration of interests:** The authors declare no conflicting interest.

**Funding:** None

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