*Review Article*

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# Exercise Therapy for Tennis Elbow/Lateral Epicondylitis/ Lateral Epicondylalgia/Lateral Elbow Pain: A Descriptive Overview

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**Abstract**

The objective of this review article was to Get an insight into the role of exercise in LEP, along an evidence-informed approach of overview of current literature.There were studies comparing exercises as adjunct compared with other related conservative treatments either given alone or in combination. Specific stretching upon identifying ECRB, ED, ECRL or FCR muscle dysfunction, and a combination of concentric and eccentric strengthening with Cyriax physiotherapy of deep transverse friction massage and Mill's manipulation may be attempted for use in a comprehensive rehabilitative approach for LEa.The evidence for exercise therapy is equivocal, and considering fewer adverse events and better functional restoration in people with LEa, exercises are a viable, feasible and a cost-effective treatment adjunct to be used in combination with other conservative treatment methods for pain relief, grip strength and functional status.

**Keywords:** Upper Extremity Soft Tissue Injuries; Sports Injuries; Elbow Tendinopathy; Orthopaedic Rehabilitation.

Lateral elbow pain (LEP) is a recently regarded symptomatic term of the originally recognized clinical condition of lateral epicondylitis (LE) which is defined as the inflammation of the common extensor origin at the lateral epicondyle. Occurrence of this condition more frequently amongst tennis players due to 'backhand' stroke essentiated use of the term, Tennis elbow (TE). More recently, absence of inflammatory biomarkers in the area led to acceptance of the term lateral epicondylalgia (LEa), more as a degenerative condition. The objective of this review article was to get an insight into the role of exercise in LEP, along an evidence-informed approach of overview of current literature.

*Resistance Exercises*

Landis et al [1] evaluated and compared the EMG activity of the selected forearm muscles (extensor digitorum (ED), extensor carpi radialis brevis (ECRB) and flexor carpi radialis (FCR)) during three different types of resistive (strengthening) therapeutic exercises (rubber ball, theraputty, and "make-it-disappear" (MID) sponge) in five participants with lateral epicondylitis (LE). Relative activity was noted to be greatest for ED and FCR during MID exercise and for ECRB during putty exercise.

*Stretching v/s Stretching & Strengthening*

Martinez-Silvestriniet al [2] evaluated the effectiveness of eccentric strengtheningin 94 subjects who were allocated randomly into three groups: stretching, concentric strengthening with stretching, and eccentric strengthening with stretching, for six weeks; in addition to instruction on icing, stretching, and avoidance of aggravating activities. All three groups had improvements in pain-free grip strength, Patient-rated Forearm Evaluation Questionnaire, Disabilities of the Arm, Shoulder, and Hand

questionnaire, Short Form 36, and visual analog pain scale with no differences among the three groups.

*Cyriax Physiotherapy Versus Supervised Exercise*

Nagraleet al [3] compared Cyriax physiotherapy (deep transverse friction massage in combination with Mill's manipulation) versus phonophoresis with supervised exercise in 60 patients presenting with the teno-periosteal variety of lateral epicondylalgia who were randomized into two groups- control group received phonophoresis with diclofenac gel over the area of the lateral epicondyle for 5 minutes combined with supervised exercise. The experimental group received 10 minutes of deep transverse friction massage followed by a single application of Mill's manipulation. Both groups improved significantly with greater improvements for experimental group regarding pain, pain-free grip, and functional status.

Viswaset al [4] compared supervised exercise program and Cyriax physiotherapy in 20 patients, of whom Group A (n = 10) had received supervised exercise program. Group B (n = 10) was treated with Cyriax physiotherapy for three treatment sessions per week for four weeks.Although both treatments were effective in reduction of pain and in the improvement of functional status, the supervised exercise programme resulted in greater improvement in comparison to those who received Cyriax physiotherapy.

*Manipulation, Exercise, and Physical Therapy*

Radpasand [5] presented a case of 57-year old woman who was successfully treated with a 10-week specific sequential multimodal conservative management approach(high-velocity and low-amplitude manipulation, high-voltage pulsed galvanic stimulation, a hard-padded elbow brace, ice, and exercise, along with restricted use of the affected elbow) to chronic lateral epicondylitis and reported a systematic reduction of pain, specific activity, and usual activity, and even after 3 weeks of follow-up.

*Cyriax Physiotherapy, a Supervised Exercise Programme and Polarized Polychromatic Non-Coherent Light (Bioptron light)*

Stasinopoulos and Stasinopoulos [6] compared the effectiveness of Cyriax physiotherapy, a supervised exercise programme, and polarized polychromatic non-coherent light (Bioptron light) in 75 patients where Group A (n = 25) was treated with Cyriax physiotherapy. A supervised exercise programme was given to group B (n = 25). Group C (n = 25) received polarized polychromatic non-coherent light (Bioptron light) for three treatments per week for a total period of four weeks.The supervised exercise programme had better outcomes on pain and function post- treatmentat every follow-up.

*Low-Level Laser and Plyometric Exercises*

Stergioulas [7] compared laser and plyometric exercise versus placebo laser and plyometric exercise on 50 patients who were randomised into two groups. Group A (n = 25) was treated with a 904 Ga-As laser CW, frequency 50 Hz, intensity 40 mW and energy density 2.4 J/cm(2), plus plyometric exercises and group B (n = 25) that received placebo laser plus the same plyometric exercises. "The group A had (1) a significant decrease of pain at rest at the end of 8 weeks of the treatment and at the end of following up period, (2) a significant decrease in pain at palpation and pain on isometric testing at 8 weeks of treatment, and at 8 weeks follow-up, (3) a significant decrease in pain during middle finger test at the end of 8 weeks of treatment, and at the end of the follow-up period, (4) a significant decrease of pain during grip strength testing at 8 weeks of treatment, and at 8 weeks follow-up, (5) a significant increase in the wrist range of motion at 8 weeks follow-up, (6) an increase in grip strength at 8 weeks of treatment and at 8 weeks follow-up, and (7) a significant increase in weight-test at 8 weeks of treatment and at 8 weeks follow-up.

*Motion-Simulating Stretching Exercises*

Takasaki et al [8] measured muscle strain on the extensor carpi radialislongus (ECRL) and extensor carpi radialisbrevis (ECRB) in 12 frozen thawed cadavers to identify effective stretching positions. The increases in muscle strain were measured from a standard position (45 degrees elbow flexion, neutral forearm, and neutral wrist) to 12 sequential arm and wrist positions. The findings were as follows; "Muscle strain on the ECRL and ECRB with the elbow at 45 degrees flexion was less than 10% regardless of forearm and wrist positions, whereas the majority of it was greater than 10% with the elbow extended. Maximal muscle strain on the ECRL and ECRB was obtained with elbow extension, forearm pronation, and wrist flexion-ulnar deviation, with mean values of 17.8% and 13.8%, respectively."

*Mobilisation with Movement and Exercise*

Vicenzinoet al [9] performed a quasi-experimental

study to derive a clinical prediction rule for identifying 64 patients with lateral epicondylalgia (LE) who were likely to respond to mobilisation with movement and exercise (PT). The CPRincluded: age <49 years, as well as pain free grip strength on the affected >112N, and unaffected side <336N. Probability of improvement rose from 79 to 100% if all three were positive.

There were studies comparing exercises as adjunct compared with other related conservative treatments either given alone orin combination. Specific stretching upon identifying ECRB, ED, ECRL or FCR muscle dysfunction, and a combination of concentric and eccentric strengthening with Cyriax physiotherapy of deep transverse friction massage and Mill's manipulation may be attempted for use in a comprehensive rehabilitative approach for LEa.

The evidence for exercise therapy is equivocal, and considering fewer adverse events and better functional restoration in people with LEa, exercises are a viable, feasible and a cost-effective treatment adjunct to be used in combination with other conservative treatment methods for pain relief, grip strength and functional status.

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