Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

The effect of eccentric exercises on maximum grip strength, function, pain and thickness of common extensor tendon in patients with chronic lateral epicondylitis

Protocol summary

Study aim
Comparative examination of effect of eccentric exercises on maximum grip strength, function, pain and thickness of common extensor tendon in patients with chronic lateral epicondylitis.

Design
The study has a control group and is a randomized clinical trial, parallel and one-way blind.

Settings and conduct
In this study, patients will participate in two treatment groups for 6 weeks. Both groups receive routine physical therapy treatments during 12 treatment sessions twice a week in a physiotherapy center of the hospital and perform daily stretching exercises and ice massages at home. The treatment group also performs progressive eccentric strengthening exercises 3 times a day with 10-15 repetitions and at least 1-minute rest between each time. The assessor measures variables before and after the completion of the treatment period.

Participants/Inclusion and exclusion criteria
Inclusion criteria: Patients with chronic lateral epicondylitis. Abnormal appearance of the common extensor tendon in the ultrasound image.The average age is 55-35 years. Moderate pain; Exclusion criteria: Pain in the lateral epicondyle of the humerus due to involvement of the neck, shoulders and thorax. Acute inflammation.Trauma to the elbow. Patients with other specific problems in the upper extremities. Any surgical treatment, medication, topical injection and physiotherapy during the last 3 months.

Intervention groups
Both of control and treatment groups receive wrist extensor muscle stretching, ultrasound, massage friction, TENS anti analgesia during the session of physiotherapy treatment. In addition to the routine physiotherapy treatments, the treatment group performs progressive eccentric strengthening exercises.

Main outcome variables
Tendon thickness، Pain، Maximum hand grip strength, Function

General information

Reason for update
Acronym
IRCT registration information
IRCT registration number: **IRCT20180728040618N7**
Registration date: **2023-07-01, 1402/04/10**
Registration timing: **prospective**

Last update: **2023-07-01, 1402/04/10**
Update count: **0**

Registration date
2023-07-01, 1402/04/10

Registrant information
Name
Holakoo Mohsenifar
Name of organization / entity
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Iran (Islamic Republic of)
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Recruitment status
Recruitment complete
Funding source

Expected recruitment start date
2023-07-21, 1402/04/30
Expected recruitment end date
2023-10-22, 1402/07/30
Actual recruitment start date
empty

Actual recruitment end date
empty
Trial completion date
empty

Scientific title
The effect of eccentric exercises on maximum grip strength, function, pain and thickness of common extensor tendon in patients with chronic lateral epicondylitis

Public title
The effect of eccentric exercises on pain and function in patients with chronic lateral epicondylitis
Purpose
Treatment
Inclusion/Exclusion criteria
Inclusion criteria:
Patients with chronic lateral epicondylitis(more than 3 months) Moderate pain based on the VAS scale (between 3-7) in the external epicondyle of the humerus, which increases with active wrist extension and decreases with rest Positive Mills test Positive Cozen test Positive Maudslesy Existence of tenderness at the tenoperiosteal site or at the junction of the common extensor tendon to the external epicondyle of the humerus The average age is 55-35 years referred by a doctor
Exclusion criteria:
Pain in the lateral epicondyle of the humerus due to involvement of the neck, shoulders and thorax Acute lateral epicondylitis Pain in the lateral epicondyle of the humerus following a trauma to the elbow Radial tunnel syndrome and pain in the posterior interosseous nerve pathway Inflammation of the elbow joint Damage to the internal and external ligaments of the elbow joint Sensory disturbance in the involved limb Patients with bilateral symptoms or other specific problems in the upper extremities Neck problems Any surgical treatment, medication, topical injection and physiotherapy during the last 3 months Pregnancy Infection in the elbow joint Malignancy Hemophilia Dissatisfaction of participants in the study Patients with mental disorders or inability to communicate Patients who refuse to exercise
Age
From **35 years** old to **55 years** old
Gender
Both

Phase
N/A
Groups that have been masked

- Outcome assessor

Sample size
Target sample size: **30**
Randomization (investigator's opinion)
Randomized
Randomization description
Samples are randomly assigned to one of the two groups of usual passive physiotherapy and progressive eccentric strengthening exercises equally by the restricted randomization and law of random allocation (drawing a card from the number of cards equal to the sample size and entering a group of two groups).
Blinding (investigator's opinion)
Single blinded
Blinding description
After placing the patients in the desired group, they are asked not to provide their grouping information to the examiner. All evaluations will be performed by a physical therapist. This person does not know about the grouping of patients with external epicondylitis of the elbow. In other words, during the initial and final evaluation of the patients, the examiner is not able to distinguish what type of treatment each patient received. Therapeutic interventions will be applied by another physiotherapist.
Placebo
Not used
Assignment
Parallel
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Ethics committee of Iran University of Medical Sciences
Street address
Iran University of Medical Sciences, Shahid Hemmat Highway, Tehran
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Tehran
Province
Tehran
Postal code
1449614535
Approval date
2022-01-26, 1400/11/06
Ethics committee reference number
IR.IUMS.REC.1400.991

Health conditions studied

1

Description of health condition studied
Chronic lateral epicondylitis
ICD-10 code
M77.1
ICD-10 code description
Lateral epicondylitis

Primary outcomes

1

Description
Tendon thickness

Timepoint
Before the intervention and after the last treatment session
Method of measurement
Ultrasonographic imaging

2

Description
Pain
Timepoint
Before the intervention and after the last treatment session
Method of measurement
Visual analog scale

3

Description
Maximum hand- grip strength
Timepoint
Before the intervention and after the last treatment session
Method of measurement
Digital hand held dynamometer

Secondary outcomes

1

Description
Function
Timepoint
Before the intervention and after the last treatment session
Method of measurement
The PREE questionnaire is used to measure performance. This questionnaire has 20 questions that examine two areas of pain and disability. The first field examines the degree of elbow pain in 5 questions. The maximum total score of this field is 50 (for each question, 0 pain-free state, and 10 maximum imaginable pain). The second field is related to disability, which measures a person's functional capacity during special activities (11 items) and usual activities (4 items). The maximum score of this domain is 50 (for each question, 0 is no limit, and 10 is the maximum difficulty to perform the activity). The final score of this questionnaire ranges from zero (the best score) to 100 (the worst score).

Intervention groups

1

Description
Control group: People receive stretching of the wrist extensor muscles, ultrasound, friction massage, and analgesic TENS during physiotherapy treatment. Stretching exercises for both groups are performed 2 times a day with 3 repetitions and 30 seconds rest between each repetition, in such a way that the person is standing and his shoulder is at a 90-degree flexion angle and his elbow is at a 0-degree flexion angle and his palm is It is towards the ground and with the healthy hand, he takes his wrist to flexion and ulnar deviation and maintains the tension for 30 seconds. In this study, ultrasound with a frequency of 1 Mhz and an intensity of 1-1.5 W/Cm2 is used. The circumference of the applicator head is four square centimeters, which is applied to the junction of the tendon of the extensor carpi radialis brevis muscle for 5 minutes. The modern pain-relieving TENS device is used with high frequency (110Hz) and intermittently in time intervals of 200 µs and with an intensity that is strong for the patient and at the same time tolerable. Ice massage for the people of both groups is performed 3 times a day using an ice pack in the painful area of the external epicondyle in a circle for 5-10 minutes until this area becomes numb.
Category
Rehabilitation

2

Description
Intervention group: The treatment group performed progressive eccentric strengthening exercises while sitting in a straight position, while their elbows and wrists are in maximum extension and forearms are in pronation and supported by a surface, and the palms are facing the ground so that the wrists are used for performing movements. It hangs freely. The patient is asked to slowly bend the wrist for 30 counts and use the opposite hand to return it to the original position. This exercise is performed 3 times a day with 10 repetitions and at least 1-minute rest between each time. Before and after performing these exercises, wrist extensor muscles are stretched and finally, ice massage is performed on the external epicondyle of the humerus. Eccentric exercises are started at a low speed with or with weights according to the individual's condition, and the individual is told to continue the exercise if he has mild pain (pain less than 4 on the linear scale of pain), but if it worsens and becomes unbearable If pain occurs, stop the exercise. When the person will be able to do the exercise without any pain and discomfort, the exercise is done at a medium speed and with the same load, and again when the person does not feel pain and discomfort at this level, the exercise is done quickly. When the person is able to perform high-speed training without feeling pain and discomfort, the training load will be increased by using free weights based on the ten-repetition maximum of the patients. And during treatment, progress continues in this way. Eccentric exercises are taught to the patient in the first session of treatment, and corrections and improvements are made during weekly appointments for people to receive TENS and ultrasound treatment.
Category
Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center
School of Rehabilitation Sciences of Iran University of Medical Sciences

Full name of responsible person
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Sponsors / Funding sources

1

Sponsor

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Grant name

Grant code / Reference number

Is the source of funding the same sponsor organization/entity?
Yes

Title of funding source
Iran University of Medical Sciences

Proportion provided by this source
100

Public or private sector
Public

Domestic or foreign origin
Domestic

Category of foreign source of funding
empty

Country of origin

Type of organization providing the funding
Academic

Person responsible for general inquiries

Contact

Name of organization / entity
Iran University of Medical Sciences

Full name of responsible person
Holakoo Mohsenifar

Position
Assistant professor

Latest degree
Ph.D.

Other areas of specialty/work
Physiotherapy

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Sharing plan

Deidentified Individual Participant Data Set (IPD)
Yes - There is a plan to make this available
Study Protocol
Yes - There is a plan to make this available
Statistical Analysis Plan
Yes - There is a plan to make this available
Informed Consent Form
Yes - There is a plan to make this available
Clinical Study Report
Yes - There is a plan to make this available
Analytic Code
Yes - There is a plan to make this available
Data Dictionary
Yes - There is a plan to make this available
Title and more details about the data/document
Deidentified individual participant data collected for the primary and secondary outcome measures will be shared if necessary
When the data will become available and for how long
Starting 6 months after publication
To whom data/document is available
The data will be available for physical therapists working in academic institutions and also clinicians working in the field of musculoskeletal disorders
Under which criteria data/document could be used
The raw data and results of this study can be used in future relevant systematic reviews. Thus, the raw data and results of this study will be available for researchers working in the field of lateral epicondylitis treatment and effects of eccentric exercises.
From where data/document is obtainable
Applicants can contact the researcher of this study Sahar Torkaman by email. Email address: shr_torkaman@yahoo.com
What processes are involved for a request to access data/document
Applicants should explain in detail about their project and how the data/documents of this study will be used in their project. Then, the data/documents files will be sent by email to applicants on request. This process may takes 10-12 working days.
Comments