Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Evaluation of the effect of the shoulder-rotators strengthening exercises on grip strength and pain reduction in patients with tennis elbow.

Protocol summary

Summary

The objective of this study was to evaluate the effects of strengthening exercise of the shoulder rotator muscles on the grip strength, pain intensity and functional improvement in people with tennis elbow syndrome. Inclusion criteria were: pain in the lateral elbow; age between 20-50 years; at least 2 positive tests from 4 tennis elbow tests: Cozen's, resistive and passive tennis elbow and chair lift tests. Exclusion criteria were: History of any fracture or Surgery in the upper limb; History of Rheumatoid diseases and Osteoarthritis in the upper extremity joints; any disease or disorder of the central or peripheral nervous system. This study was a single blinded randomized clinical trial. The sample size was 32 (16 patients in each group).The Patients who referred to the physiotherapy clinic of Shiraz school of rehabilitation sciences, recruited by convenience sampling method. The subjects in the control group received routine physiotherapy and the subjects in the intervention group received the strengthening exercises of shoulder internal and external rotator muscles beside routine physiotherapy. Both groups receive 10 treatment sessions for two consecutive weeks. The pain intensity (visual analogue scale), functional improvement (Standardized method for assessment of elbow function), shoulder rotator strength, pain free grip and maximum grip strength measured before and after the intervention protocols in both groups.

General information

Acronym

IRCT registration information

IRCT registration number: **IRCT2014071615932N5**
Registration date: **2014-08-23, 1393/06/01**
Registration timing: **retrospective**

Last update:
Update count: **0**

Registration date

2014-08-23, 1393/06/01

Registrant information

Name
Alireza Motealleh
Name of organization / entity
Shiraz University of Medical Sciences
Country
Iran (Islamic Republic of)
Phone
+98 71 1626 5108
Email address
motealleh@sums.ac.ir

Recruitment status

Recruitment complete

Funding source

Shiraz University of Medical Sciences

Expected recruitment start date

2012-10-11, 1391/07/20

Expected recruitment end date

2013-02-18, 1391/11/30

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Evaluation of the effect of the shoulder-rotators strengthening exercises on grip strength and pain reduction in patients with tennis elbow.

Public title

The effect of the shoulder muscles strengthening in treatment of patients with tennis elbow.

Purpose

Treatment

Inclusion/Exclusion criteria
inclusion criteria: pain in the origin of common wrist extensor muscles in the lateral elbow; presence of symptoms exist at least for 2 months; age between 20-50 years; functional assessment scores between 9 to 22 on the base of "standardized method for assessment of elbow function"; at least 2 positive tests from 4 tennis elbow tests: Cozen's, resistive tennis elbow test, passive tennis elbow test and chair lift test. exclusion criteria: surgery on any part of the upper extremity in the past 12 months; history of any fracture or dislocation in the upper limb; history or symptoms of rheumatoid diseases and osteoarthritis in the upper extremity joints; any disease or disorder of the central nervous system including: stroke, MS and ...; any disease of peripheral nervous system which may affect the study results such as: Neuropathies, carpal tunnel syndrome, Guyan tunnel syndrome and cervical Radiculopathy (specially the seventh cervical root)

Age
From **20 years** old to **50 years** old

Gender
Both

Phase
N/A

Groups that have been masked
No information

Sample size
Target sample size: **32**

Randomization (investigator's opinion)
Randomized

Randomization description

Blinding (investigator's opinion)
Single blinded

Blinding description

Placebo
Not used

Assignment
Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Shiraz University of Medical Sciences

Street address
Central building of Shiraz University of Medical Sciences, Zand avenue, Shiraz

City
Shiraz

Postal code

Approval date
2012-10-10, 1391/07/19

Ethics committee reference number
90-01-06-4233

Health conditions studied

1

Description of health condition studied
Tennis elbow

ICD-10 code
M77.1

ICD-10 code description
Lateral epicondylitis, Tennis elbow

Primary outcomes

1

Description
pain intensity

Timepoint
before and after intervention

Method of measurement
visual analogue scale

2

Description
strength of shoulder rotator muscles

Timepoint
before and after intervention

Method of measurement
Newton scale with digital dynamometer

3

Description
maximum grip strength

Timepoint
before and after intervention

Method of measurement
Newton scale with digital dynamometer

4

Description
pain free grip strength

Timepoint
before and after intervention

Method of measurement
Newton scale with digital dynamometer

5

Description
Function of upper limb

Timepoint
before and after intervention

Method of measurement
The questionnaire of Standardized method for assessment of elbow function

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group: In the intervention group patients receive routine physical therapy treatment protocol for tennis elbow syndrome for 10 sessions over two consecutive weeks. The routine physical therapy treatment protocol contained: Ultrasound: continues mode, 1 MHz frequency, 1.5 W/Cm2 use for 5 min over the origin of common wrist extensor muscles; Transcutaneous electrical nerve stimulation: burst mode, internal frequency 70-100 Hz, 60 µs pulse width, tolerable intensity for 20 min over the pain site, around the elbow joint; Hot pack: for 20 minutes on the common wrist extensor muscles; Friction massage: for 1-2 min applied on the origin of common wrist extensor muscles, Massage apply while the patient's elbow and wrist is in flexion, forearm in pronation, hand in ulnar deviation and fingers in flexion. The friction massage perform in a direction perpendicular to the muscle fibers through the therapists thumb or index finger which support by the middle finger. Eccentric strengthening exercise for extensor muscles was performed in the seated position with elbow extension, forearm pronation, and maximum wrist extension. From this position, the patient slowly lowered wrist into flexion while holding a weight, and then using the contralateral hand to return the wrist to maximum extension (3 sets × 10 reps; 1 min rest btw sets). The forearm muscle stretching was performed while the patient lying in supine position with the shoulder in abduction and then the therapist apply passive stretching to the patients wrist extensors and forearm supinators (through flexing the wrist pronating the forearm). wrist pronating the forearm). The intervention group receive shoulder rotator muscles strengthening exercises (Oxford method) in addition to the routine physical therapy treatment in each session. For strengthening of shoulder external rotators, the subject was positioned side-lying on a bed with involved shoulder up (lying on the healthy side), arm resting on the side of the thorax with a rolled towel under the axilla and the elbow bent at a 90° angle. The patient was instructed to keep the elbow against his side and slowly rotate the arm at the shoulder and raising the weight to a vertical position (rotate the arm toward external rotation). For strengthening of shoulder internal rotators The subject was positioned side-lying on a bed on the involved side, with the arm forward in partial flexion and the elbow bent at a 90° angle. The patient was instructed to Keep the elbow bent and slowly rotate the arm at the shoulder, lift the weight upward off the table to a vertical position (rotate the arm toward internal rotation). It should be stated that a weight cuff that is determined by 10RM for each person, fasten close to the wrist (about 20% of forearm length proximal to the wrist joint).

Category

Rehabilitation

2

Description

Control group: In the control group patients receive routine physical therapy treatment protocol for tennis elbow syndrome for 10 sessions over two consecutive weeks. The routine physical therapy treatment protocol contained: Ultrasound: continues mode, 1 MHz frequency, 1.5 W/Cm2 use for 5 min over the origin of common wrist extensor muscles; Transcutaneous electrical nerve stimulation: burst mode, internal frequency 70-100 Hz, 60 µs pulse width, tolerable intensity for 20 min over the pain site, around the elbow joint; Hot pack: for 20 minutes on the common wrist extensor muscles; Friction massage: for 1-2 min applied on the origin of common wrist extensor muscles, Massage apply while the patient's elbow and wrist is in flexion, forearm in pronation, hand in ulnar deviation and fingers in flexion. The friction massage perform in a direction perpendicular to the muscle fibers through the therapists thumb or index finger which support by the middle finger. Eccentric strengthening exercise for extensor muscles was performed in the seated position with elbow extension, forearm pronation, and maximum wrist extension. From this position, the patient slowly lowered wrist into flexion while holding a weight, and then using the contralateral hand to return the wrist to maximum extension (3 sets × 10 reps; 1 min rest btw sets). The forearm muscle stretching was performed while the patient lying in supine position with the shoulder in abduction and then the therapist apply passive stretching to the patients wrist extensors and forearm supinators (through flexing the wrist pronating the forearm).

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

School of Rehabilitation Sciences

Full name of responsible person

Dr. Alireza Motealleh

Street address

NO.32, Abiverdi 1 Avenue, Chamran Blvd, Shiraz, Fars

City

Shiraz

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Shiraz University of Medical Sciences

Full name of responsible person

Dr. Gholamreza Hatam

Street address

Central building of Shiraz University of Medical

Sciences, Zand avenue, Shiraz

City

Shiraz

Grant name

Grant code / Reference number

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

Yes

Title of funding source

Shiraz University of Medical Sciences

Proportion provided by this source

100

Public or private sector

empty

Domestic or foreign origin

empty

Category of foreign source of funding

empty

Country of origin

Type of organization providing the funding

empty

Person responsible for general inquiries

Contact

Name of organization / entity

Shiraz University of Medical Sciences

Full name of responsible person

Zeinab Shirzadi

Position

Student

Other areas of specialty/work

Street address

School of Rehabilitation Sciences, Abiverdi 1 Avenue, Chamran Blvd, Shiraz

City

Shiraz

Postal code

Phone

+98 71 1627 1552

Fax

Email

shirzadi.zeinab@gmail.com

Web page address

Person responsible for scientific inquiries

Contact

Name of organization / entity

Shiraz University of Medical Sciences

Full name of responsible person

Dr. Alireza Motealleh

Position

Ph.D

Other areas of specialty/work

Street address

School of Rehabilitation Sciences, Abiverdi 1 Avenue, Chamran Blvd, Shiraz

City

Shiraz

Postal code

Phone

+98 71 1627 1552

Fax

Email

pmotealeh@yahoo.com

Web page address

Person responsible for updating data

Contact

Name of organization / entity

Shiraz University of Medical Sciences

Full name of responsible person

Zeinab Shirzadi

Position

Student

Other areas of specialty/work

Street address

School of Rehabilitation Sciences, Abiverdi 1 Avenue, Chamran Blvd, Shiraz

City

Shiraz

Postal code

Phone

+7 116271552

Fax

Email

Shirzadi.zeinab@sums.ac.ir

Web page address

Sharing plan

Deidentified Individual Participant Data Set (IPD)

empty

Study Protocol

empty

Statistical Analysis Plan

empty

Informed Consent Form

empty

Clinical Study Report

empty

Analytic Code

empty

Data Dictionary

empty