Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

The comparison of effectiveness of open and closed kinetic chain exercise in reducing knee pain and improving the normal function of the patients with patellofemoral pain syndrome

Protocol summary

Summary

The purpose of this study is to compare the effectiveness of open and closed kinetic chain exercise therapy in reducing knee pain and improving the normal function of the patients with patellofemoral pain syndrome. This study will be done as the single-center randomized clinical trial in patients with patellofemoral pain syndrome, referred to Rasool-e-Akram hospital. Inclusion criteria are anterior knee pain for at least two months, Positive Clark's test, induction of the pain in up or down stairs and other knee full flexion situations. Exclusion criteria are knee osteoarthritis and other associated problems of the knee. In this study 64 patients eligible for inclusion, will be divided in two groups by block randomization. The first group will receive open-kinetic chain exercises and the second the closed-kinetic chain exercises. The open chain exercises group will do quadriceps static contraction and straight leg raising exercises. The closed chain exercise group will do semi squat, wall slide and step ups. The patient's pain and function will be assessed pre intervention , one and two months post intervention by Visual Analogue Scale ruler, Kujala and Functional Index questionnaires.

General information

Acronym

IRCT registration information

IRCT registration number: **IRCT2014090719073N1**
Registration date: **2016-03-18, 1394/12/28**
Registration timing: **registered_while_recruiting**

Last update:
Update count: **0**

Registration date

2016-03-18, 1394/12/28

Registrant information

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Recruitment status

Recruitment complete

Funding source

Vice Chancellor for research of Iran University of Medical Sciences

Expected recruitment start date

2014-09-23, 1393/07/01

Expected recruitment end date

2016-09-22, 1395/07/01

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The comparison of effectiveness of open and closed kinetic chain exercise in reducing knee pain and improving the normal function of the patients with patellofemoral pain syndrome

Public title

comparison of two methods of exercise therapy in patellofemoral pain syndrome

Purpose

Treatment

Inclusion/Exclusion criteria
Inclusion Criteria: feeling of pain on the anterior or posterior part of the knee or around patella at least for 2 months ; Positive Clark's test; induction of pain in at least two of following situation: in up or down-stair, squatting, running, jumping, cycling, kneeling and sitting with flexed knee for prolong period. Exclusion criteria:Pain intensity less than score 3 according to VAS; history of Knee locking; patellar dislocation; knee osteoarthritis; abnormal finding in the knee X-ray; knee infection; Knee ligaments injuries; Knee physiotherapy for the 3 recent months; history of knee surgery;Knee traumatic injuries; genovalgum and Osgood- Schlatter or any other pathologic diseases.

Age
From **18 years** old to **70 years** old

Gender
Both

Phase
N/A

Groups that have been masked
No information

Sample size
Target sample size: **64**

Randomization (investigator's opinion)
Randomized

Randomization description

Blinding (investigator's opinion)
Not blinded

Blinding description

Placebo
Not used

Assignment
Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Iran University of Medical Sciences

Street address
Iran University of Medical sciences, south side of Hemmat highway, Tehran, Iran.

City
Tehran

Postal code

Approval date
2014-09-06, 1393/06/15

Ethics committee reference number
93-02-30-24740-104043

Health conditions studied

1

Description of health condition studied
Chondromalacia patella

ICD-10 code
M22.4

ICD-10 code description
Disorders of patella

Primary outcomes

1

Description
pain

Timepoint
before intervention, 1 months after intervention, 2 months after intervention

Method of measurement
Visual Analogue Scale ruller

2

Description
knee performance

Timepoint
before intervention, 1 months after intervention, 2 months after intervention

Method of measurement
Kujala questiannaire و Functional Index questionnaire

Secondary outcomes

1

Description

Timepoint

Method of measurement

Intervention groups

1

Description
The patients in open chain exercises group will do static quadriceps contraction and the Straight leg raising exercises for two months.In the first week, they will do the exercises two times a day with ten repetitions, the hold time of static contraction will be ten seconds.The exercise therapy program will be progressed to three times a day in the second week and three times a day with 15 repetitions in the third week. At the fourth week, the exercise therapy program will be progressed to three times a day and the hold time of static contraction will be 15 seconds. The progression of exercise therapy will continue in the same way until the end of the 8th week.

Category
Rehabilitation

2

Description
The patients in the closed chain exercises group will do semi-squat, wall slide and step ups for two months. The progression method of exercise therapy in closed chain exercises group will be as same as the open chain exercises group.

Category
Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center
Rasool-e-Akram Hospital

Full name of responsible person
Ali Mazaherinezhad

Street address
Rasool-e-Akram Hospital, Niyayesh Ave, Sattarkhan St., Tehran, Iran.

City
Tehran

Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Vice chancellor for research, Iran University of Medical Sciences

Full name of responsible person
Seyed Ali Javad Moosavi

Street address
Iran University of Medical sciences, south side of Hemmat highway, Tehran, Iran.

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Tehran

Grant name

Grant code / Reference number

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

Title of funding source
Vice chancellor for research, Iran 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
Iran University of medical sciences

Full name of responsible person
Ali Mazaherinezhad

Position
Assistant Professor

Other areas of specialty/work

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Person responsible for updating data

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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