

Clinical Trial Protocol

Iranian Registry of Clinical Trials

17 Jun 2026

Comparison of effectiveness of neuromuscular electrical stimulation and proprioception neuromuscular facilitation on EMG and balance in knee osteoarthritis

Protocol summary

Summary

1) Objectives: The purpose of this study is the comparison of effectiveness of neuromuscular electrical stimulation and proprioceptive neuromuscular facilitation on EMG and balance of knee osteoarthritis patients. 2) Design: In this study patients will be evaluated through main outcomes and then randomly assigned into 4 treatment groups. Patients will be treated for 4 weeks 3 session each week and will have reassessment after treatments and 1 month follow up. 3) Setting and conduct: Variables are balance, muscle electrical activity, pain and function which will be measured respectively by Biodex balance, EMG, VAS and WOMAC questioner. The instruments that will be used in this study is electro stimulator 620P, teraband for PNF pattern performance and ice pack in the ice therapy group. 4) Participants including major eligibility criteria: Those patients suffering from knee arthritis aged between 35-54 years old that will be referred from a specialist, achieving WOMAC score at least 25 and VAS score at least 4 will be included. 5) Intervention: Patients will be randomly allocated to 4 groups: 1) Routine physical therapy with NMES and PNF on quadriceps and hamstring muscles 2) Routine physical therapy with PNF on hamstring and quadriceps 3) Routine physical therapy with icing for hamstring and PNF for quadriceps 4) Routine physical therapy with routine exercise 6) Main variables: Pain, function, balance and electromyography (EMG)

General information

Acronym

IRCT registration information

IRCT registration number: **IRCT2017011226443N3**

Registration date: **2017-05-01, 1396/02/11**

Registration timing: **registered_while_recruiting**

Last update:

Update count: **0**

Registration date

2017-05-01, 1396/02/11

Registrant information

Name

Ahmad Reza Asgari Ashtiani

Name of organization / entity

Zahedan University of Medical Sciences

Country

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Phone

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Email address

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Recruitment status

Recruitment complete

Funding source

Vice chancellor for research, Zahedan University of Medical Sciences

Expected recruitment start date

2017-02-19, 1395/12/01

Expected recruitment end date

2017-07-21, 1396/04/30

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparison of effectiveness of neuromuscular electrical stimulation and proprioception neuromuscular facilitation on EMG and balance in knee osteoarthritis

Public title

Comparison of effectiveness of neuromuscular electrical stimulation and proprioception neuromuscular facilitation on EMG and balance in knee osteoarthritis

Purpose

Treatment

Inclusion/Exclusion criteria

Main inclusion criteria: Confirmation of knee osteoarthritis diagnosis by a specialist; WOMAC score 25 at least; VAS 4 at least; age between 35 to 54
Main exclusion criteria: History of knee fracture, tendon, meniscus and ligament tearing; rheumatoid arthritis; hip or ankle musculoskeletal disorders; central or peripheral neuropathy; history of physical therapy in last month; corticosteroid injection in last month; unconscious patients; neoplasia disorders, deep vein thrombosis, neurological dysfunction; severe obesity; pacemaker

Age

From **35 years** old to **54 years** old

Gender

Both

Phase

2-3

Groups that have been masked

No information

Sample size

Target sample size: **54**

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

Ethics Committee of Zahedan University of Medical Sciences

Street address

Deputy of Research, Zahedan University of Medical Sciences, Jannat Blvd., Dr. Hesabi Sq.

City

Zahedan

Postal code

Approval date

2016-12-18, 1395/09/28

Ethics committee reference number

IR.ZAUMS.REC.1395.234

Health conditions studied

1

Description of health condition studied

knee osteoarthritis

ICD-10 code

M17.1

ICD-10 code description

Other primary gonarthrosis

Primary outcomes

1

Description

electromyographic activity

Timepoint

before and after intervention and 1 month later

Method of measurement

EMG

Secondary outcomes

1

Description

pain

Timepoint

before and after intervention and 1 month later

Method of measurement

VAS

2

Description

balance

Timepoint

before and after intervention and 1 month later

Method of measurement

biodex balance system

3

Description

function

Timepoint

before and after intervention and 1 month later

Method of measurement

WOMAC questionnaire

Intervention groups

1

Description

Second interventional group: Routine physical therapy treatment with quadriceps and hamstring strengthening by PNF pattern

Category

Rehabilitation

2

Description

First interventional group: Routine physical therapy treatment with quadriceps strengthening by PNF pattern and hamstring inhibition by ice

Category

Rehabilitation

3

Description

Third interventional group: Routine physical therapy with quadriceps and hamstring strengthening by PNF pattern and NMES

Category

Rehabilitation

4

Description

Control group: Routine physical therapy

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Razmjou Moghadam clinic

Full name of responsible person

Bahareh Khodadadi

Street address

Kafami street. Razmjou Moghadam laboratory.
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City

Zahedan

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Vice Chancellor for Research, Zahedan University of Medical Sciences

Full name of responsible person

Dr. Mohsen Taheri

Street address

Jannat Blvd., Dr. Hesabi Sq, Zahedan University of Medical Sciences, Deputy of Research

City

Zahedan

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, Zahedan 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

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Full name of responsible person

Bahareh Khodadadi Bohlouli

Position

master student

Other areas of specialty/work

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Ph.D in Physiotherapy

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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