Clinical Trial Protocol
Iranian Registry of Clinical Trials

05 Jul 2026

Ultrasound-guided Prolotherapy, Oxygen-ozone and corticosteroid injection for treatment of knee osteoarthritis: A randomized, double-blind, multi-center study.

Protocol summary

Study aim

To compare effect of ultrasound guided Corticosteroid, Ozone and Dextrose injection in patients with knee osteoarthritis. Non-surgical treatments are the first line in treatment of this condition. Corticosteroid injections are one of the treatment options for knee osteoarthritis. Recently, ozone and dextrose injections has been used as a treatment for these patients. These injections lack many of the disadvantages of corticosteroid injections.

Design

A phase 3, umulticenteral, randomized, double blinded, clinical trial with a parallel group design with one week and two months followed ups. 1cc lidocaine 2% will be used for local anesthesia (skin) in all groups. Then, under sterile condition, one group will be received ultrasound guided Ozone injection from Pes Anserine burs at medial below knee. Injections will be performed with 25G needle and other groups will receive corticosteroid or dextrose prolotherapy.

Settings and conduct

Patients with knee osteoarthritis referred to physiatrists clinics in Iran and Tabriz (University of Medical Sciences)

Participants/Inclusion and exclusion criteria

Inclusion criteria: Patients with mild to moderate osteoarthritis of the knee (Kellgren Lawrence grade I, II and III) Knee pain for at least six months. Exclusion criteria: History of knee surgery or fracture History of knee meniscus or ligaments tear (ACL/PCL/MCL/LCL) Pregnancy History of allergic reaction to Corticosteroid, Dextrose or Ozone Infection at the injection site Uncontrolled diabetes History of systemic inflammatory or connective tissue disease History of knee injections in the last three months History of gout Secondary knee osteoarthritis Contraindications of ozone therapy (deficiency G6PD, uncontrolled hyperthyroidism, leukemia)

Intervention groups

Three ultrasound guided injection groups : 1.Corticosteroid, 2.Ozone 3.Dextrose

Main outcome variables

Visual Analogue Scale, WOMAC

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20151017024572N23**
Registration date: **2020-08-01, 1399/05/11**
Registration timing: **prospective**

Last update: **2020-08-01, 1399/05/11**
Update count: **0**

Registration date

2020-08-01, 1399/05/11

Registrant information

Name

Arash Babaei-Ghazani

Name of organization / entity

Country

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2020-08-21, 1399/05/31

Expected recruitment end date

2021-08-22, 1400/05/31

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Ultrasound-guided Prolotherapy, Oxygen-ozone and corticosteroid injection for treatment of knee osteoarthritis: A randomized, double-blind, multi-center study.

Public title

Ultrasound-guided Prolotherapy, Oxygen-ozone and corticosteroid injection for treatment of knee osteoarthritis

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria:

Patients with mild to moderate osteoarthritis of the knee (Kellgren Lawrence grade I, II and III) Knee pain for at least six months

Exclusion criteria:

History of knee surgery or fracture History of knee meniscus or ligaments tear (ACL/PCL/MCL/LCL) Pregnancy History of allergic reaction to Corticosteroid, Dextrose or Ozone Infection at the injection site Uncontrolled diabetes History of systemic inflammatory or connective tissue disease History of knee injections in the last three months History of gout Secondary knee osteoarthritis Contraindications of ozone therapy (deficiency G6PD, uncontrolled hyperthyroidism, leukemia)

Age

From **40 years** old

Gender

Both

Phase

3

Groups that have been masked

- Participant
- Investigator
- Outcome assessor
- Data analyser

Sample size

Target sample size: **42**

Randomization (investigator's opinion)

Randomized

Randomization description

Participants will be randomly divided into three treatment groups using a table of random numbers and a centralized randomization method. In order to execute the randomization process to create a random sequence and to perform the random allocation process we will use RAS software which will be created by statisticians. Two hours before the patient's visit for injection, the person responsible for injection will contact the statistician by phone or text message and will ask her about the random assignment of the participant to a specific group.

Blinding (investigator's opinion)

Double blinded

Blinding description

The injection material is prepared in the syringe without informing the patient and the syringes will be covered with an aluminum foil so that the participant does not know the type of injection material. Patients will be prohibited from receiving any NSAIDs or analgesics for a 15-day wash-out period prior to enrollment and intervention. Due to the different nature of ozone (gas), during the injection, there is a possibility that the injector will acknowledge the nature of this medical substance. The person responsible for outcome measures and the person responsible for the statistical analysis are also kept blind.

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, Next to Milad Tower, Shahid Hemmat Highway, Tehran

City

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Province

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Postal code

1449614535

Approval date

2020-03-17, 1398/12/27

Ethics committee reference number

IR.IUMS.REC.1398.1414

Health conditions studied

1

Description of health condition studied

Osteoarthritis of knee

ICD-10 code

M17

ICD-10 code description

Osteoarthritis of knee

Primary outcomes

1

Description

Visual Analog Scale (VAS)

Timepoint
Before intervention, 1 and 8 weeks after intervention
Method of measurement
Visual Analogue Scale Questionnaire

Secondary outcomes

1

Description
Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)
Timepoint
Before intervention and 1, 8 weeks after intervention
Method of measurement
Questionnaire

Intervention groups

1

Description
Intervention group one: Corticosteroid, 40 mg Methylprednisolone, one time injection inside knee joint at suprapatellar recess
Category
Treatment - Other

2

Description
Intervention group: Intervention group two: Ozone (O2-O3), 12 micro-gram, one time injection inside knee joint at suprapatellar recess
Category
Treatment - Other

3

Description
Intervention group three: Prolotherapy (Dextrose 20 %), one time injection inside knee joint at suprapatellar recess
Category
Treatment - Other

Recruitment centers

1

Recruitment center
Name of recruitment center
Rasool Akram Hospital, Iran University of Medical Sciences, Neuromusculoskeletal Research Center
Full name of responsible person
Arash Babaei-Ghazani
Street address
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Recruitment center
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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
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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

Dr. Arash Babaei

Position

Associate professor

Latest degree

Specialist

Other areas of specialty/work

Physical Medicine

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Person responsible for updating data

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Sharing plan

Deidentified Individual Participant Data Set (IPD)

No - There is not a plan to make this available

Justification/reason for indecision/not sharing IPD

Data will only be provided for journal during manuscript submission or for meta-analysis at the specific request of other individuals.

Study Protocol

Yes - There is a plan to make this available

Statistical Analysis Plan

Undecided - It is not yet known if there will be a plan to make this available

Informed Consent Form

Undecided - It is not yet known if there will be a plan to make this available

Clinical Study Report

Yes - There is a plan to make this available

Analytic Code

Not applicable

Data Dictionary

Not applicable

Title and more details about the data/document

There is no further information

When the data will become available and for how long

There is no further information

To whom data/document is available

There is no further information

Under which criteria data/document could be used

There is no further information

From where data/document is obtainable

There is no further information

What processes are involved for a request to access data/document

There is no further information

Comments