# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

07 Nov 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**

Tehran

**Province**

Tehran

**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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### 2

**Recruitment center**
**Name of recruitment center**
Shohada & Emam Reza Hospitals, Tabriz University of Medical Sciences
**Full name of responsible person**
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## Sponsors / Funding sources

### 1

**Sponsor**
**Name of organization / entity**
Iran University of Medical Sciences
**Full name of responsible person**
Dr. Seyed Abas Motavallian
**Street address**
5th floor central building, Iran University of Medical Sciences, Shahid Hemmat Highway,
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**Email**
PR@iums.ac.ir
**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 scientific inquiries

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**Full name of responsible person**

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**Position**

Associate professor

**Latest degree**

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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**