# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

22 Nov 2026

## Evaluation of therapeutic effect of placental mesenchymal stem cell exosome injection in improving clinical symptoms and MRI changes in patients with knee osteoarthritis

## Protocol summary

**Study aim**

Evaluation of therapeutic effect of placental mesenchymal stem cell exosome injection in improving subjective symptoms and objective imaging findings in patients with knee osteoarthritis

**Design**

Clinical trial with control group, with parallel groups, triple blinded, randomized, phase 3 on 30 patients.

**Settings and conduct**

In this triple blinded clinical trial, patients with osteoarthritis of the knee referred Taleghani hospitals were randomly divided into two groups of 30 patients. Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and Lequesne Index as well as Visual Analogue Scale (VAS) are completed for patients. All patients undergo X-ray imaging and MRI of the knee. The intervention group received exosome injection and exercise therapy, and the control group received normal saline injection and exercise therapy. The mentioned questionnaires, in addition to the time before the intervention, will be completed at the end of months 2 and 6 for all patients. At the end of month 6, MRI of the knees is repeated.

**Participants/Inclusion and exclusion criteria**

Inclusion criteria: 1) pain in both knees during the last 6 months, 2) graphic confirmation of bilateral knee osteoarthritis with grade 2 or 3; Exclusion criteria: 1) younger than 45 years or older than 65 years, 2) any intra-articular injection of the knee during the last 3 months

**Intervention groups**

Patients in the intervention group received 5 cc of exosome in the knee joint, and the control group received 5 cc of normal saline. Knee strengthening and stretching exercises are taught to patients in both groups.

**Main outcome variables**

VAS; WOMAC Index; Lequesne index; Patellofemoral cartilage volume; Tibiofemoral cartilage volume; Knee joint synovitis; Internal and external meniscus disintegration; Patellofemoral cartilage erosion; Tibiofemoral cartilage erosion; Anterior cruciate ligament injury

## General information

**Reason for update**

**Acronym**

**IRCT registration information**

IRCT registration number: **IRCT20210423051054N1**
Registration date: **2022-05-11, 1401/02/21**
Registration timing: **prospective**

Last update: **2022-05-11, 1401/02/21**
Update count: **0**

**Registration date**

2022-05-11, 1401/02/21

**Registrant information**

**Name**

Rasa Salmani Oshnari

**Name of organization / entity**

**Country**

Iran (Islamic Republic of)

**Phone**

+98 21 2223 1012

**Email address**

rasa_salmani@yahoo.com

**Recruitment status**

**Recruitment complete**

**Funding source**

**Expected recruitment start date**

2022-06-22, 1401/04/01

**Expected recruitment end date**

2022-09-22, 1401/06/31

**Actual recruitment start date**

empty

**Actual recruitment end date**

empty

**Trial completion date**

empty

**Scientific title**

Evaluation of therapeutic effect of placental mesenchymal stem cell exosome injection in improving clinical symptoms and MRI changes in patients with knee osteoarthritis

**Public title**

The effect of exosomes in the treatment of knee osteoarthritis

**Purpose**

Treatment

**Inclusion/Exclusion criteria**

**Inclusion criteria:**

Pain in both knees over the past 6 months, which is related to the degenerative process of the knee, requires pain medication and has lasted for more than a month. Graphical confirmation of bilateral knee osteoarthritis with grade 2 or 3 based on the Kellgren-Lawrence classification. The knee pain intensity should be greater than or equal to 4 according to the VAS.

**Exclusion criteria:**

Younger than 45 years or older than 65 years Rheumatic or collagen vascular disease History of malignancy Coagulopathy or taking anticoagulant drug Any injection into the knee joint during the last 3 months A history of recent severe knee trauma in the past 1 month Septic arthritis of the knee or active wound of the knee joint Genovarum or genovalgum greater than 20 degrees Total knee replacement Cardiac pacemaker Cochlear implantation Existence of fragments or foreign metal object in the knee or around the arteries, nerves and brain

**Age**

From **45 years** old to **65 years** old

**Gender**

Both

**Phase**

3

**Groups that have been masked**

- Participant
- Care provider
- Investigator
- Outcome assessor
- Data analyser

**Sample size**

Target sample size: **30**

More than 1 sample in each individual

Number of samples in each individual: **2**

One knee as intervention and the other knee as control

**Randomization (investigator's opinion)**

Randomized

**Randomization description**

In this clinical trial study, 30 patients with bilateral osteoarthritis of the knee, referred to the physical medicine and rehabilitation clinic of Taleghani Hospital in Tehran, will be randomly entered into the study. Random Allocation software will be used for random assignment of samples. Random sequences from 1 to 30 will be created using this software. Random allocation concealment method will be used for hiding. In this way, the created sequences are recorded on cards and these cards will be placed in sealed envelopes. Then, according to the order of entry of eligible people to study, each envelope will be opened and their assigned number will be determined. Thus, if the desired number was even, the right knee will be selected as the intervention and the left knee as the control, and if the desired number is odd, the left knee will be selected as the intervention and the right knee as the control.

**Blinding (investigator's opinion)**

Triple blinded

**Blinding description**

According to the codings performed for patients and drugs, all patients, caregivers, data collector, people who evaluate the outcomes, as well as data analyzer, for the intervention performed in each patient (drug or Placebo) are unaware. Both knees of the patient are injected. Drug is injected in one knee and placebo in the other, randomly.

**Placebo**

Used

**Assignment**

Parallel

**Other design features**

## Secondary Ids

empty

## Ethics committees

**1**

**Ethics committee**

**Name of ethics committee**

Ethics committee of Shahid Beheshti University of Medical Sciences

**Street address**

Shahid Beheshti University of Medical Sciences, Yaman St, Shahid Chamran Hwy

**City**

Tehran

**Province**

Tehran

**Postal code**

1985717443

**Approval date**

2022-03-08, 1400/12/17

**Ethics committee reference number**

IR.SBMU.MSP.REC.1400.773

## Health conditions studied

**1**

**Description of health condition studied**
Knee osteoarthritis
**ICD-10 code**
M17.0
**ICD-10 code description**
Bilateral primary osteoarthritis of knee

## Primary outcomes

**1**

**Description**
Pain intensity
**Timepoint**
Before intervention, 2 and 6 months after intervention
**Method of measurement**
Visual Analogue Scale

**2**

**Description**
Pain intensity, stiffness, and physical activity
**Timepoint**
Before intervention, 2 and 6 months after intervention
**Method of measurement**
Western Ontario and McMaster Universities Osteoarthritis Index

**3**

**Description**
Pain or discomfort, maximum distance walked, and activities of daily living
**Timepoint**
Before intervention, 2 and 6 months after intervention
**Method of measurement**
Lequesne Index

**4**

**Description**
Patellofemoral cartilage volume
**Timepoint**
Before intervention and 6 months after intervention
**Method of measurement**
Magnetic resonance imaging

**5**

**Description**
Tibiofemoral cartilage volume
**Timepoint**
Before intervention and 6 months after intervention
**Method of measurement**
Magnetic resonance imaging

**6**

**Description**
Knee joint synovitis
**Timepoint**
Before intervention and 6 months after intervention
**Method of measurement**
Magnetic resonance imaging

**7**

**Description**
Medial and lateral meniscus disintegration
**Timepoint**
Before intervention and 6 months after intervention
**Method of measurement**
Magnetic resonance imaging

**8**

**Description**
Patellofemoral cartilage erosion
**Timepoint**
Before intervention and 6 months after intervention
**Method of measurement**
Magnetic resonance imaging

**9**

**Description**
Tibiofemoral cartilage erosion
**Timepoint**
Before intervention and 6 months after intervention
**Method of measurement**
Magnetic resonance imaging

**10**

**Description**
Anterior cruciate ligament injury
**Timepoint**
Before intervention and 6 months after intervention
**Method of measurement**
Magnetic resonance imaging

## Secondary outcomes

empty

## Intervention groups

**1**

**Description**
Intervention group: Injection of 5 cc of placental mesenchymal stem cell exosome into the knee with anterolateral approach in the flexed position, isometric strengthening exercises for quadriceps, adductor and abductor muscles of the thigh (10 times and each time for 10 seconds), 2 times a day, and stretching of hamstrings (3 times and each time for 30 seconds), 2 times a day.
**Category**
Treatment - Drugs

**2**

**Description**

Control group: Injection of 5 cc of normal saline into the knee with anterolateral approach in the flexed position, isometric strengthening exercises for quadriceps, adductor and abductor muscles of the thigh (10 times and each time for 10 seconds), 2 times a day, and stretching of hamstrings (3 times and each time for 30 seconds), 2 times a day.

**Category**
Placebo

## Recruitment centers

**1**

**Recruitment center**

**Name of recruitment center**
Taleghani hospital

**Full name of responsible person**
Rasa Salmani Oshnari

**Street address**
Taleghani Hospital, Yaman St, Shahid Chamran Hwy

**City**
Tehran

**Province**
Tehran

**Postal code**
1985711151

**Phone**
+98 21 2243 2560

**Email**
rasa_salmani@yahoo.com

## Sponsors / Funding sources

**1**

**Sponsor**

**Name of organization / entity**
Shahid Beheshti University of Medical Sciences

**Full name of responsible person**
Afshin Zarghi

**Street address**
Shahid Beheshti University of Medical Sciences, Yaman St, Shahid Chamran Hwy

**City**
Tehran

**Province**
Tehran

**Postal code**
1985717443

**Phone**
+98 21 2243 9780

**Email**
info@sbmu.ac.ir

**Grant name**

**Grant code / Reference number**

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

**Title of funding source**
Shahid Beheshti 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**
Shahid Beheshti University of Medical Sciences

**Full name of responsible person**
Rasa Salmani Oshnari

**Position**
Resident

**Latest degree**
Medical doctor

**Other areas of specialty/work**
Physical Medicine

**Street address**
Shohadaye Tajrish Hospital, Shahrdari St, Tajrish Sq

**City**
Tehran

**Province**
Tehran

**Postal code**
1989934148

**Phone**
+98 21 25719

**Email**
rasa_salmani@yahoo.com

## Person responsible for scientific inquiries

**Contact**

**Name of organization / entity**
Shahid Beheshti University of Medical Sciences

**Full name of responsible person**
Najmeh Sadat Bolandnazar

**Position**
Assistant Professor

**Latest degree**
Specialist

**Other areas of specialty/work**
Physical Medicine

**Street address**
Taleghani Hospital, Yaman St, Shahid Chamran Hwy

**City**
Tehran

**Province**
Tehran

**Postal code**
1115119857

**Phone**
+98 21 2243 2560

**Email**

n.sadat.bolandnazar@gmail.com

## Person responsible for updating data

**Contact**

**Name of organization / entity**
Shahid Beheshti University of Medical Sciences

**Full name of responsible person**
Rasa Salmani Oshnari

**Position**
Resident

**Latest degree**
Medical doctor

**Other areas of specialty/work**
Physical Medicine

**Street address**
Shohadaye Tajrish Hospital, Shahrdari St, Tajrish Sq

**City**
Tehran

**Province**
Tehran

**Postal code**
1989934148

**Phone**
+98 21 25719

**Email**
rasa_salmani@yahoo.com

## Sharing plan

**Deidentified Individual Participant Data Set (IPD)**
Undecided - It is not yet known if there will be a plan to make this available

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

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

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