Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Formulation of herbal topical gel based on Traditional Persian Medicine and comparison of its effects with diclofenac topical gel in osteoarthritis patients

Protocol summary

Study aim

To formulate a topical herbal gel based on Traditional Persian Medicine and compare its efficacy with diclofenac topical gel in reducing pain and improving functional status in patients with knee osteoarthritis.

Design

A phase III, parallel-group, double-blind, randomized controlled trial with 86 participants (43 per group). Randomization will be performed using a simple random method with a random number table.

Settings and conduct

The trial will be conducted at the Geriatric Research Institute, Tabriz University of Medical Sciences. Participants and outcome assessors will be blinded through identical packaging and coding of the gels.

Participants/Inclusion and exclusion criteria

Inclusion: Age 40–80 years, primary knee osteoarthritis confirmed radiologically, knee pain for ≥2 weeks. Exclusion: Secondary osteoarthritis, active liver/kidney disease, diabetes, skin conditions at application site, use of anti-inflammatory drugs within 15 days, pregnancy.

Intervention groups

Two parallel groups: 1. Intervention: Topical herbal gel containing extracts of Lawsonia inermis, Ricinus communis, Nigella sativa, and Biebersteinia multifida. 2. Control: Topical diclofenac gel 1%. Both applied three times daily for 4 weeks.

Main outcome variables

Primary: Change in knee pain intensity measured by Numeric Rating Scale (NRS). Secondary: Change in functional disability measured by Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), quality of life measured by Short Form-36 (SF-36), and safety profile.

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20250527065942N2**
Registration date: **2026-01-06, 1404/10/16**
Registration timing: **retrospective**

Last update: **2026-01-06, 1404/10/16**
Update count: **0**

Registration date

2026-01-06, 1404/10/16

Registrant information

Name

Faezeh Ahanj

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 41 3337 4787

Email address

faezeh.ahj@gmail.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-01-05, 1404/10/15

Expected recruitment end date

2026-01-05, 1404/10/15

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Formulation of herbal topical gel based on Traditional Persian Medicine and comparison of its effects with diclofenac topical gel in osteoarthritis patients

Public title

herbal topical gel in osteoarthritis

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria:

Primary osteoarthritis in at least one knee, confirmed by radiological criteria on a knee radiograph (Kellgren-Lawrence grades 1, 2, and 3). Presence of pain for a minimum of two weeks prior to the initiation of therapy. Age between 40 and 80 years. Performance of routine laboratory tests (CBC with differential, FBS, LFT, BUN, Cr, ESR, CPK, serum calcium and phosphorus) and, in suspected cases, thyroid and coagulation tests (INR, PTT, PT) to rule out secondary causes.

Exclusion criteria:

Secondary osteoarthritis or suspicion thereof. Active hepatic or renal disease. Peptic ulcer disease (PUD). Diabetes mellitus (uncontrolled). Thyroid or parathyroid disease/disorder. Coagulopathies or use of anticoagulant medications. A history of ischemic or hemorrhagic stroke. A history of deep vein thrombosis (DVT). Hypersensitivity to any form of anti-inflammatory drugs. Acute trauma. A history of alcohol consumption or drug abuse. Presence of dermatological diseases, infection, or wounds at the intended site of topical drug application. Use of corticosteroids by any route/for any indication. Concurrent use of any other topical medication at the intended site of drug application. Oral use of any other analgesics or compounds effective in the treatment of osteoarthritis within 10 days prior to the study initiation. Pregnancy. Chronic therapy with immunosuppressive drugs/medications. Receipt of corticosteroids within the past 3 months. Administration of non-steroidal anti-inflammatory drugs (NSAIDs) within the preceding 15 days. Bilateral knee osteoarthritis requiring treatment in both knees. Poorly-controlled diabetes mellitus. Blood dyscrasia. Allergy to hyaluronan (HA) or avian proteins (should these be used in the intervention).

Age

From **40 years** old to **80 years** old

Gender

Both

Phase

3

Groups that have been masked

- Participant
- Investigator

Sample size

Target sample size: **86**

Randomization (investigator's opinion)

Randomized

Randomization description

In this study, participants will be allocated to two groups: the intervention group (herbal product) and the control group (diclofenac gel). Allocation will be performed through simple randomization (using a random number table or random number generation software). Given that both the participants and the outcome assessors (those administering questionnaires and measurements) will be blinded to the allocated product type, the study is designed as double-blind. The drug packages and gels will be identical in appearance, coded, and dispensed to the patients.

Blinding (investigator's opinion)

Double blinded

Blinding description

This study will be conducted as a double-blind trial. The detailed blinding procedure for each group is as follows: 1. Participants (Patients): - Patients will be unaware of the type of treatment they receive (herbal product or diclofenac gel). - Both products will be provided in identical packaging and appearance (colorless gel, odorless, and with similar texture). - Labels on the packages will contain only a unique patient code and administration instructions, with no indication of the drug contents. 2. Healthcare Personnel (Physicians, Nurses, Physiotherapists): - Physicians and nurses who prescribe the treatment and conduct patient visits will be blinded to the treatment assigned to each patient. - All products will be prepared and dispensed by the study pharmacy unit according to the randomization codes. 3. Outcome Assessors: - Individuals responsible for assessing primary and secondary outcomes (pain, function, quality of life) will be blinded to each patient's treatment assignment. - Assessments will be performed at specified time points (baseline, 4 weeks after treatment initiation, and 2 weeks after treatment completion) by personnel independent of the treatment team. **4. Data Collectors: - Individuals responsible for collecting and entering questionnaire data will remain unaware of patient group assignments. 5. Statisticians: - Data analysts will remain blinded to group codes until the completion of the primary analysis. 6. Data Safety and Monitoring Board (DSMB): - If convened, DSMB members may access group allocation information only in essential situations (e.g., occurrence of serious adverse events). 7. Research Team (Principal Investigator and Collaborators): - All members of the research team, except the personnel responsible for randomization and drug preparation, will remain blinded to group assignments. Patient Information: All patients will be fully informed about the study objectives, procedures, potential benefits, and risks, and written informed consent will be obtained from each participant. Failure to inform patients would constitute a violation of ethical and legal principles. Unblinding: In emergency situations (e.g., severe allergic reactions or serious adverse events), unblinding will be permitted for the treating physician and the patient. All such cases will be carefully documented and included in the final analysis.

Placebo

Not used

Assignment

Parallel

Other design features

This study is designed as a randomized, double-blind, parallel-group clinical trial. Participants will be allocated

into two groups, each receiving one type of intervention (herbal or diclofenac). Allocation will be performed using a simple randomization method, and blinding will be implemented through coded drug packages and by keeping the outcome assessors unaware of the assignments.

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Ethics Committee of Tabriz University of Medical Sciences

Street address
Student Research and Technology Committee Tabriz University of Medical Sciences Pardis Street, Pishghadam Street, Tabriz, Iran

City
tabriz

Province
East Azarbaijan

Postal code
۳۳۳۵۹۶۸۰

Approval date
2025-11-17, 1404/08/26

Ethics committee reference number
IR.TBZMED.REC.1404.631

Health conditions studied

1

Description of health condition studied
Primary osteoarthritis of the knee

ICD-10 code
M17.1

ICD-10 code description
Unilateral primary osteoarthritis of knee

Primary outcomes

1

Description
Mean change in knee pain intensity score based on the Numeric Rating Scale (NRS)

Timepoint
Before intervention (baseline), 4 weeks after starting the intervention, and 2 weeks after the end of intervention (week 6)

Method of measurement
Knee pain intensity will be measured using a 10 cm straight ruler (Numeric Rating Scale) where 0 indicates "no pain" and 10 indicates "unbearable pain". Patients will mark their pain level on the scale.

Secondary outcomes

empty

Intervention groups

1

Description
Intervention group: Topical application of a formulated herbal gel containing extracts of Lawsonia inermis (Henna), Ricinus communis (Castor), Nigella sativa (Black seed), and Biebersteinia multifida (Bieberstein's feather). The gel will be applied three times daily (approximately every 8 hours) on the affected knee(s) for a duration of 4 weeks.

Category
Treatment - Drugs

Recruitment centers

1

Recruitment center

Name of recruitment center
Aging research institute, Tabriz University of Medical Sciences

Full name of responsible person
Faezeh Ahanj

Street address
Tabriz City, Golgasht Street, Tabriz University of Medical Sciences, Geriatric Research Institute

City
Tabriz

Province
East Azarbaijan

Postal code
5165990001

Phone
+98 41 3334 2178

Fax

Email
aria@tbzmed.ac.ir

Web page address
https://aria.tbzmed.ac.ir/?MID=58

Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Iran University of Medical Sciences

Full name of responsible person
Dr Khosro Adibkia

Street address
Tabriz City, Golgasht Street, Tabriz University of Medical Sciences, Geriatric Research Institute

City
Tabriz

Province
East Azarbaijan

Postal code
5165990001
Phone
+98 41 3334 2178
Email
aria@tbzmed.ac.ir
Web page address
https://aria.tbzmed.ac.ir/?MID=58

Grant name
Not applicable (This study is proposed as a research project/thesis, and no specific grant name is mentioned)
Grant code / Reference number
Not applicable
Is the source of funding the same sponsor organization/entity?
No
Title of funding source
Tabriz University of Medical Sciences (Research Vice-Chancellor)
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
Ali Asghar Hamidi
Position
Associate Professor
Latest degree
Ph.D.
Other areas of specialty/work
Others
Street address
Tabriz City, Golgasht Street, Tabriz University of Medical Sciences, Faculty of Pharmacy, Department of Pharmaceutical Chemistry
City
Tabriz
Province
East Azarbaijan
Postal code
5165990001
Phone
+98 41 3334 2178
Email
aria@tbzmed.ac.ir
Web page address
https://aria.tbzmed.ac.ir/?MID=58

Person responsible for scientific inquiries

Contact
Name of organization / entity
Iran University of Medical Sciences
Full name of responsible person
Ali Asghar Hamidi
Position
Associate Professor
Latest degree
Ph.D.
Other areas of specialty/work
Others
Street address
Tabriz City, Golgasht Street, Tabriz University of Medical Sciences, Faculty of Pharmacy, Department of Pharmaceutical Chemistry
City
Tabriz
Province
East Azarbaijan
Postal code
5165990001
Phone
+98 41 3334 2178
Email
aria@tbzmed.ac.ir
Web page address
https://aria.tbzmed.ac.ir/?MID=58

Person responsible for updating data

Contact
Name of organization / entity
Iran University of Medical Sciences
Full name of responsible person
Ali Asghar Hamidi
Position
Associate Professor
Latest degree
Ph.D.
Other areas of specialty/work
Others
Street address
Tabriz City, Golgasht Street, Tabriz University of Medical Sciences, Faculty of Pharmacy, Department of Pharmaceutical Chemistry
City
Tabriz
Province
East Azarbaijan
Postal code
5165990001
Phone
+98 41 3334 2178
Email
aria@tbzmed.ac.ir
Web page address
https://aria.tbzmed.ac.ir/?MID=58

Sharing plan

Deidentified Individual Participant Data Set (IPD)
Yes - There is a plan to make this available

Study Protocol
Yes - There is a plan to make this available

Statistical Analysis Plan
Yes - There is a plan to make this available

Informed Consent Form
Yes - There is a plan to make this available

Clinical Study Report
Yes - There is a plan to make this available

Analytic Code
Yes - There is a plan to make this available

Data Dictionary
Yes - There is a plan to make this available

Title and more details about the data/document
Deidentified individual participant dataset including baseline characteristics, pain intensity scores (NRS/WOMAC), functional disability scores (WOMAC/Lequesne), quality of life scores (SF-36), adverse events, and treatment adherence data collected during the study.

When the data will become available and for how long
Data will become available 12 months after publication of the primary results (expected by December 2026) and will remain accessible for at least 10 years.

To whom data/document is available
Available to researchers, academic institutions, and students for non-commercial scientific research purposes upon reasonable request.

Under which criteria data/document could be used
Data may be used for meta-analyses, validation studies, methodological research, or educational purposes. Requests must include a clear research proposal, ethical approval from the applicant’s institution, and a signed data use agreement.

From where data/document is obtainable
Requests should be submitted via email to: aliasgharhamidi47@gmail.com; hamidia@tbzmed.ac.ir Or via postal mail to: Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Tabriz University of Medical Sciences, Golgasht Street, Tabriz, East Azerbaijan, Iran.

What processes are involved for a request to access data/document
1. Submission of formal request with research proposal. 2. Review by the study steering committee (within 4–6 weeks). 3. Signing of data sharing agreement. 4. Data delivery in encrypted format via secure electronic transfer. Total process time: approximately 6–10 weeks.

Comments
All shared data will be fully anonymized to protect participant confidentiality. The study team reserves the right to reject requests that do not meet scientific or ethical standards.