Clinical Trial Protocol
Iranian Registry of Clinical Trials

08 Nov 2026

Evaluation of the effectiveness of oral caffeine compared to aggressive hydration in preventing post-spinal anesthesia headache in cesarean section surgeries

Protocol summary

Study aim

To compare the effectiveness of oral caffeine versus aggressive hydration in preventing post-spinal headache (PDPH) in women undergoing elective cesarean section.

Design

Double-blind, parallel RCT, two arms (caffeine vs. placebo), block randomization (size 4) with computer-generated numbers in sealed envelopes, 1:1 allocation, 68 participants (34/group), single-center.

Settings and conduct

The trial will be conducted in teaching hospitals affiliated with Ahvaz Jundishapur University. Recruitment is planned over 4 months. Participants, investigators, care providers, and outcome assessors are blinded. An independent pharmacist prepares identical capsules. The allocation sequence is concealed in sealed envelopes and opened after enrollment. Outcomes are assessed at 24, 48, and 72 hours post-surgery by trained assessors unaware of group assignment.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Pregnant women 20–40y, ASA I-II, singleton, no CVD, coagulopathy, caffeine allergy, gestational hypertension, migraine, no caffeine in prior 12h, willing to consent. Exclusion criteria: Refusal, conversion to general anesthesia, complications, SBP<100 mmHg, non-cooperation.

Intervention groups

Caffeine group: Oral caffeine capsule (200 mg) 30 minutes before spinal anesthesia, plus standard aggressive hydration (4000 mL normal saline over 24 hours). Control group: Identical placebo capsule 30 minutes before spinal anesthesia, plus the same hydration protocol.

Main outcome variables

Primary: Incidence and severity of PDPH assessed by the Verbal Category Scale (VCS) at 24, 48, and 72 hours post-surgery. Secondary: Time to headache onset; frequency of associated symptoms (neck stiffness, nausea, vomiting, photophobia, tinnitus, phonophobia); and adverse effects or intolerance to treatments.

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20210222050463N8**
Registration date: **2026-08-08, 1405/05/17**
Registration timing: **prospective**

Last update: **2026-08-08, 1405/05/17**
Update count: **0**

Registration date

2026-08-08, 1405/05/17

Registrant information

Name

Noushin Sarvi Sarmeidani

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 61 3390 6395

Email address

sarvi.n@ajums.ac.ir

Recruitment status

recruiting

Funding source

Expected recruitment start date

2026-09-05, 1405/06/14

Expected recruitment end date

2026-12-20, 1405/09/29

Actual recruitment start date

empty

Actual recruitment end date
empty
Trial completion date
empty

Scientific title
Evaluation of the effectiveness of oral caffeine compared to aggressive hydration in preventing post-spinal anesthesia headache in cesarean section surgeries

Public title
Comparison of oral caffeine and aggressive hydration for preventing headache after spinal anesthesia in cesarean section
Purpose
Prevention
Inclusion/Exclusion criteria
Inclusion criteria:
Adult pregnant women aged 20 to 40 years Scheduled for elective cesarean section under spinal anesthesia American Society of Anesthesiologists (ASA) physical status I or II Singleton pregnancy No known cardiovascular disease No coagulation disorders or use of anticoagulants No history of caffeine sensitivity Absence of gestational hypertension disorders (including chronic hypertension, gestational hypertension, and preeclampsia) No history of migraines or chronic headaches Absence of any food or beverage containing caffeine within 12 hours prior to surgery Willing to participate and provide written informed consent
Exclusion criteria:
Patient refusal to participate at any time during the study Need to change the anesthesia method to general anesthesia during the procedure Occurrence of intraoperative complications that require specific intervention Baseline systolic blood pressure below 100 mmHg during the procedure Patient failure to cooperate in completing questionnaires or postoperative assessments
Age
From **20 years** old to **40 years** old
Gender
Female

Phase
N/A
Groups that have been masked

- Participant
- Care provider
- Investigator
- Outcome assessor

Sample size
Target sample size: **68**
Randomization (investigator's opinion)
Randomized
Randomization description
Method of randomization: Block randomization with a block size of 4 will be used to ensure balanced allocation between the two groups.Unit of randomization: Individual participant (each pregnant woman).Randomization strata: No stratification will be applied, as the study population is homogeneous based on inclusion criteria (ASA I-II, elective cesarean section, etc.).Tools used in randomization: A computer-generated random number sequence will be produced using statistical software (e.g., SPSS or Excel). The allocation sequence will be concealed in opaque, sealed, sequentially numbered envelopes.How the random sequence was built: An independent research assistant, not involved in patient recruitment or outcome assessment, will generate the random allocation sequence using a computer algorithm. The sequence will determine assignment to either the intervention group (oral caffeine) or the control group (aggressive hydration) in a 1:1 ratio.Allocation concealment: The sealed envelopes will be opened sequentially by the same research assistant only after the patient has provided informed consent and all baseline data have been collected. This ensures that neither the enrolling clinician nor the patient knows the allocation in advance (concealed allocation).
Blinding (investigator's opinion)
Double blinded
Blinding description
This is a double-blind, randomized controlled trial. The following individuals/groups will be blinded to the allocation of participants to the intervention (oral caffeine) or control (aggressive hydration) groups: Participants (patients): All participants will receive a capsule 30 minutes before spinal anesthesia. The intervention group receives a 200 mg caffeine capsule, while the control group receives a placebo capsule that is identical in size, shape, color, and taste. Neither the patients nor their families will know which capsule they have received. Investigators and care providers: The research team members who recruit participants, obtain informed consent, administer the capsules, and provide perioperative care will be blinded to the group allocation. The capsules will be prepared and coded by an independent pharmacist who is not involved in any other aspect of the study. The allocation code will be kept sealed until the final data analysis is completed. Outcome assessors: The trained research assistants who assess headache incidence and severity (using the Verbal Category Scale) and record associated symptoms (neck stiffness, nausea, photophobia, etc.) at 24, 48, and 72 hours post-surgery will be blinded to the group assignment. They will have no access to the randomization list or the capsule codes. Data analysts (optional): To further reduce bias, the statistician who performs the final data analysis will also be blinded. The data file will be coded with group labels (e.g., Group A and Group B) without revealing which is the intervention or control group. The code will be broken only after the final statistical report is prepared. How blinding is achieved: The randomization sequence and capsule codes are generated and maintained by an independent researcher who is not involved in patient recruitment, care, or outcome assessment. Opaque, sealed, sequentially numbered envelopes containing the allocation are opened only after patient enrollment, and the corresponding coded capsule is administered. The placebo capsule is identical to the caffeine capsule in appearance (size, color, weight) and administration method. Outcome assessors and data collectors are not

present during the randomization process and do not have access to the allocation envelopes or codes. Thus, all key personnel (participants, investigators, care providers, and outcome assessors) are masked, ensuring a double-blind design. The data analyst will also be blinded if feasible.

Placebo
Used

Assignment
Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Ethics committee of Ahvaz Jundishapur University of Medical Sciences

Street address
Vice Chancellery for Research and Technology, 1st Floor, Ahvaz Jundishapur University of Medical Sciences, Golestan Blvd., Ahvaz

City
Ahvaz

Province
Khouzestan

Postal code
6135715794

Approval date
2026-07-24, 1405/05/02

Ethics committee reference number
IR.AJUMS.REC.1405.194

Health conditions studied

1

Description of health condition studied
Spinal and epidural anesthesia-induced headache during the puerperium (Post-dural puncture headache)

ICD-10 code
O89.4

ICD-10 code description
Spinal and epidural anesthesia-induced headache during the puerperium

Primary outcomes

1

Description
Severity of post-spinal anesthesia headache (PDPH)

Timepoint
Assessed at 24, 48, and 72 hours after surgery

Method of measurement
The Verbal Category Scale (also known as the Simple Descriptive Pain Scale), a one-dimensional tool where patients select one of five words (mild, discomforting, distressing, horrible, or excruciating) to describe their pain intensity. The scale is administered by trained research assistants who are blinded to the group allocation.

Secondary outcomes

1

Description
Time to onset of headache after spinal anesthesia

Timepoint
Assessed at 24, 48, and 72 hours after surgery

Method of measurement
The exact time (in hours) from the administration of spinal anesthesia to the first report of headache by the patient, as recorded by the research assistant during postoperative assessments.

2

Description
Frequency of associated symptoms with post-spinal headache

Timepoint
Assessed at 24, 48, and 72 hours after surgery

Method of measurement
A checklist of classic PDPH-associated symptoms including neck stiffness, nausea, vomiting, photophobia, tinnitus, and phonophobia. The presence or absence of each symptom is recorded by a trained research assistant during postoperative interviews.

3

Description
Adverse effects or intolerance to treatments

Timepoint
Assessed at 24, 48, and 72 hours after surgery

Method of measurement
Any adverse events (such as tachycardia, palpitations, nausea, vomiting, or restlessness) or patient-reported intolerance to the allocated intervention (caffeine or hydration) will be recorded by the research team using a standardized adverse event form during the postoperative follow-up visits.

Intervention groups

1

Description
Intervention group: Oral caffeine capsule (200 mg) administered with a few sips of water 30 minutes before spinal anesthesia. The capsule is manufactured by a local pharmaceutical company and is given as a single preoperative dose. This group also receives standard aggressive hydration (500 mL normal saline 0.9% infused 30 minutes before spinal anesthesia, followed by continuous infusion to total 4000 mL over 24 hours).

Category
Treatment - Drugs

2

Description
Control group: A placebo capsule identical in size, shape, color, and weight to the caffeine capsule, administered with a few sips of water 30 minutes before spinal anesthesia. The placebo is manufactured by the same pharmaceutical company and contains no active ingredient. This group also receives standard aggressive hydration (500 mL normal saline 0.9% infused 30 minutes before spinal anesthesia, followed by continuous infusion to total 4000 mL over 24 hours).
Category
Placebo

Recruitment centers

1

Recruitment center
Name of recruitment center
Imam Khomeini Hospital
Full name of responsible person
Ali Khalafi
Street address
Azadegan Blvd
City
Ahvaz
Province
Khouzestan
Postal code
6135715794
Phone
+98 61 3222 2818
Email
hemam@ajums.ac.ir

Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Ahvaz University of Medical Sciences
Full name of responsible person
Abdullah Rafiei
Street address
School of Paramedicine, Anesthesiology Department, Ahvaz Jundishapur University of Medical Sciences, Golestan Blvd., Ahvaz
City
Ahvaz
Province
Khouzestan
Postal code
6135715794
Phone
+98 61 3333 0011
Email
research@ajums.ac.ir
Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
Ahvaz 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
Ahvaz University of Medical Sciences
Full name of responsible person
Nooshin Sarvi-Sarmeydani
Position
Instructor
Latest degree
Master
Other areas of specialty/work
Anesthesiology
Street address
School of Paramedicine, Anesthesiology Department, Ahvaz Jundishapur University of Medical Sciences, Golestan Blvd., Ahvaz
City
Ahvaz
Province
Khouzestan
Postal code
6135715794
Phone
+98 61 3333 0011
Email
nooshinsarvi9192@gmail.com

Person responsible for scientific inquiries

Contact
Name of organization / entity
Ahvaz University of Medical Sciences
Full name of responsible person
Nooshin Sarvi-Sarmeydani
Position
Instructor
Latest degree
Master
Other areas of specialty/work
Anesthesiology

Street address
School of Paramedicine, Anesthesiology Department, Ahvaz Jundishapur University of Medical Sciences, Golestan Blvd., Ahvaz
City
Ahvaz
Province
Khouzestan
Postal code
6135715794
Phone
+98 61 3333 0011
Email
nooshinsarvi9192@gmail.com

Person responsible for updating data

Contact
Name of organization / entity
Ahvaz University of Medical Sciences
Full name of responsible person
Nooshin Sarvi-Sarmeydani
Position
Instructor
Latest degree
Master
Other areas of specialty/work
Anesthesiology
Street address
School of Paramedicine, Anesthesiology Department, Ahvaz Jundishapur University of Medical Sciences, Golestan Blvd., Ahvaz
City
Ahvaz
Province
Khouzestan
Postal code
6135715794
Phone
+98 61 3333 0011
Email
nooshinsarvi@gmail.com

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
Due to the limited sample size (68 participants) and the single-center nature of this investigator-initiated trial, the data are collected solely for the predefined statistical analysis outlined in the protocol. There is no current plan or funding to prepare a deidentified dataset for public sharing. However, if a reasonable request is made by other researchers after publication, the corresponding author will consider sharing aggregated data or summary statistics upon request, subject to institutional and ethical approvals.
Study Protocol
No - There is not a plan to make this available
Statistical Analysis Plan
No - There is not a plan to make this available
Informed Consent Form
No - There is not a plan to make this available
Clinical Study Report
No - There is not a plan to make this available
Analytic Code
No - There is not a plan to make this available
Data Dictionary
No - There is not a plan to make this available