Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

The Effect of Prophylactic Melatonin Administration on the Incidence of Postoperative Delirium in Diabetic Geriatric Patients Undergoing Orthopedic Surgery under General Anesthesia: A Randomized, Double-Blind, Placebo-Controlled Clinical Trial

Protocol summary

Study aim

To determine the effect of prophylactic melatonin administration on the incidence of postoperative delirium in diabetic elderly patients undergoing orthopedic surgery under general anesthesia.

Design

A randomized, double blind, placebo controlled, parallel group clinical trial (Phase 3) with a sample size of 100 patients (50 per group). Simple randomization will be performed using a computer generated random number table.

Settings and conduct

The study will be conducted in the orthopedic surgery wards and the Post Anesthesia Care Unit (PACU) of a single hospital. Participants, surgeons, anesthesiologists, nursing staff, and outcome assessors are blinded to the group assignments. Allocation concealment is maintained using coded medication packages. Delirium assessments will be performed using the Confusion Assessment Method for the Intensive Care Unit (CAM ICU) and Memorial Delirium Assessment Scale (MDAS).

Participants/Inclusion and exclusion criteria

Inclusion criteria: Patients aged 60 years or older with confirmed diabetes mellitus, candidates for elective orthopedic surgery under general anesthesia, Abbreviated Mental Test (AMT) score of 8 or higher, and willing to provide informed consent. Exclusion criteria: History of using medications with known interactions with melatonin (e.g., warfarin), known allergy to melatonin, severe cognitive impairment, or severe hepatic and renal impairment.

Intervention groups

Intervention group: Receiving 5 mg oral melatonin capsules at 21:00 the night before surgery, 30 minutes before anesthesia induction, and at 21:00 for three consecutive nights postoperatively. Control group: Receiving identically appearing placebo capsules at the exact same time points.

Main outcome variables

Incidence of postoperative delirium (based on CAM ICU criteria); severity of postoperative delirium (based on MDAS scale); duration of delirium; length of hospital stay.

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20210222050463N12**
Registration date: **2026-10-26, 1405/08/04**
Registration timing: **prospective**

Last update: **2026-10-26, 1405/08/04**
Update count: **0**

Registration date

2026-10-26, 1405/08/04

Registrant information

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Recruitment status

Not yet recruiting

Funding source

Expected recruitment start date

2026-11-23, 1405/09/02

Expected recruitment end date

2027-07-24, 1406/05/02

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The Effect of Prophylactic Melatonin Administration on the Incidence of Postoperative Delirium in Diabetic Geriatric Patients Undergoing Orthopedic Surgery under General Anesthesia: A Randomized, Double-Blind, Placebo-Controlled Clinical Trial

Public title

Effect of melatonin on preventing confusion after orthopedic surgery in elderly diabetic patients

Purpose

Prevention

Inclusion/Exclusion criteria

Inclusion criteria:

Patients aged 60 years or older. Patients with a confirmed diagnosis of diabetes mellitus. Candidates for elective orthopedic surgery (total hip replacement, total knee replacement, or fracture repair) under general anesthesia. Abbreviated Mental Test (AMT) score of 8 or higher. Willingness to participate and providing written informed consent.

Exclusion criteria:

History of using medications with known interactions with melatonin (e.g., warfarin, flumazenil, or immunosuppressive agents). Known allergy or hypersensitivity to melatonin. Severe cognitive impairment (AMT score less than 8) or history of severe psychiatric disorders. Severe hepatic or renal impairment. Active alcohol or substance abuse.

Age

From **60 years** old

Gender

Both

Phase

3

Groups that have been masked

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

Sample size

Target sample size: **100**

Randomization (investigator's opinion)

Randomized

Randomization description

This study is a randomized controlled trial. The unit of randomization is individual patients. Eligible patients will be randomly allocated into two groups (intervention and control) using a simple randomization method with a computer-generated random number table. No stratification is applied in this study. The random sequence was generated by an individual independent of the clinical team and principal investigators using a computer software to minimize selection bias. Allocation concealment will be strictly maintained using coded medication packages (identically appearing packages containing either melatonin or placebo).

Blinding (investigator's opinion)

Double blinded

Blinding description

This study is designed as a double-blind clinical trial. All patients, surgeons, anesthesiologists, nursing staff, and outcome assessors are blinded to the group assignments. To ensure this, the control group receives identically appearing placebo capsules (matching in shape, taste, and odor) at the exact same time points as the intervention group. Furthermore, allocation concealment is strictly maintained using coded medication packages. The randomization process is conducted by an individual independent of the clinical team, ensuring that the investigators and clinical staff remain unaware of the group allocations throughout the study. Outcome assessments will be performed by two independent evaluators who are also blinded to the group allocation.

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

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Province

Khouzestan

Postal code

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Approval date

2026-10-09, 1405/07/17

Ethics committee reference number

IR.AJUMS.REC.1405.342

Health conditions studied

1

Description of health condition studied
Postoperative delirium (POD) is an acute and fluctuating disturbance in attention and cognition that occurs within the first 72 hours after surgery. This study specifically investigates its incidence and severity in elderly diabetic patients following orthopedic surgery under general anesthesia.
ICD-10 code
F05
ICD-10 code description
Delirium due to known physiological condition

2

Description of health condition studied
Diabetes mellitus is a chronic metabolic disorder characterized by elevated blood glucose levels. This study focuses on elderly patients (aged 60 years and older) with a confirmed diagnosis of diabetes who are at a higher risk of developing postoperative delirium.
ICD-10 code
E11
ICD-10 code description
Type 2 diabetes mellitus

Primary outcomes

1

Description
Incidence of postoperative delirium (defined as a positive diagnosis based on the Confusion Assessment Method for the Intensive Care Unit criteria).
Timepoint
During the first 72 hours postoperatively (assessed twice daily at 8:00 AM and 8:00 PM).
Method of measurement
Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) administered by trained evaluators blinded to group allocation.

Secondary outcomes

1

Description
Severity of postoperative delirium.
Timepoint
On the days when delirium is diagnosed during the first 72 hours postoperatively.
Method of measurement
Memorial Delirium Assessment Scale.

2

Description
Duration of delirium.
Timepoint
During the first 72 hours postoperatively (assessed twice daily).
Method of measurement
Number of days with at least one positive assessment using the Confusion Assessment Method for the Intensive Care Unit.

3

Description
Length of hospital stay.
Timepoint
From the day of surgery until the day of hospital discharge.
Method of measurement
Review of patient medical records and hospital admission and discharge dates.

4

Description
Serum melatonin level.
Timepoint
Preoperatively, 24 hours postoperatively, and 72 hours postoperatively.
Method of measurement
Venous blood sampling and measurement using validated Enzyme-Linked Immunosorbent Assay kits.

Intervention groups

1

Description
Intervention group: Receiving oral melatonin capsules (5 mg) at 21:00 the night before surgery, 30 minutes before anesthesia induction, and at 21:00 for three consecutive nights postoperatively, administered with 15 mL of water.
Category
Treatment - Drugs

2

Description
Control group: Receiving identically appearing placebo capsules (matching in shape, taste, and odor) at the exact same time points (21:00 the night before surgery, 30 minutes before anesthesia induction, and 21:00 for three consecutive nights postoperatively), administered with 15 mL of water.
Category
Treatment - Drugs

Recruitment centers

1

Recruitment center
Name of recruitment center
Imam Khomeini Hospital
Full name of responsible person
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Sponsors / Funding sources

1

Sponsor

Name of organization / entity
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Full name of responsible person
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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
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
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Vahid Saidkhani

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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

Yes - There is a plan to make this available

Statistical Analysis Plan

Yes - There is 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

Not applicable

Data Dictionary

Not applicable

Title and more details about the data/document

Study Protocol and Statistical Analysis Plan: The full research proposal (protocol) approved by the Ethics Committee, and the detailed statistical analysis plan (including the methods for sample size calculation and multivariate logistic regression) used for this clinical trial.

When the data will become available and for how long

The documents will become available starting 6 months after the publication of the main study results, and will remain available for 5 years.

To whom data/document is available

Academic researchers and healthcare professionals working in recognized universities or research institutions.

Under which criteria data/document could be used

The documents can only be used for non-commercial research purposes and meta-analyses. Applicants must sign a data use agreement ensuring patient confidentiality. All requests will be reviewed and must be approved by the principal investigator and the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences.

From where data/document is obtainable

By sending a formal email request to the principal investigator, Dr. Vahid Saidkhani, at: saidkhani-v@ajums.ac.ir

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

Applicants must submit a brief research proposal and a signed data use agreement via email. The request will be reviewed by the research team within 2 to 4 weeks. Upon approval, the documents will be shared via a secure file transfer protocol.

Comments