Clinical Trial Protocol
Iranian Registry of Clinical Trials

15 Aug 2026

Comparison of efficacy and safety of extended-release versus immediate-release tacrolimus in renal transplant patients: a double-blind randomized controlled trial

Protocol summary

Study aim

To compare the efficacy and safety of extended release tacrolimus versus immediate release tacrolimus in adult de novo kidney transplant recipients during the first month after transplantation.

Design

Prospective single center double blind parallel group randomized controlled trial with two study arms and a total sample size of 200 participants. Block randomization with permuted blocks of four was used. The six possible allocation sequences (AABB, ABAB, ABBA, BBAA, BABA, and BAAB) were generated using a random number table. Eligible participants were randomly allocated in a 1:1 ratio to either the intervention group or the control group based on the pre-generated randomization list.

Settings and conduct

The trial is conducted at the kidney transplantation center of Shiraz University of Medical Sciences. Participants, investigators, healthcare providers and outcome assessors are blinded. Follow up is performed during the first month after transplantation.

Participants/Inclusion and exclusion criteria

Adult patients aged 18 years or older undergoing first kidney transplantation from deceased brain dead donors are included. Main exclusion criteria are multiple organ transplantation, retransplantation, known hypersensitivity to tacrolimus, ABO incompatible transplantation, pregnancy or lactation.

Intervention groups

Intervention group: Once-daily extended-release tacrolimus (Advagraf®, Astellas) initiated at 5 mg per day after kidney transplantation, with dose adjustment based on blood levels. Control group: Twice-daily immediate-release tacrolimus (Prograf®, Astellas) initiated at 2 mg twice daily after kidney transplantation, with dose adjustment based on blood levels.

Main outcome variables

Incidence of biopsy proven acute rejection; renal graft function assessed by serum creatinine; tacrolimus trough blood concentration.

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20230909059387N1**
Registration date: **2026-02-07, 1404/11/18**
Registration timing: **prospective**

Last update: **2026-02-07, 1404/11/18**
Update count: **0**

Registration date

2026-02-07, 1404/11/18

Registrant information

Name

Nakisa Rasaei

Name of organization / entity

Country

Iran (Islamic Republic of)

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+98 71 3638 1828

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-02-20, 1404/12/01

Expected recruitment end date

2026-03-30, 1405/01/10

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparison of efficacy and safety of extended-release versus immediate-release tacrolimus in renal transplant patients: a double-blind randomized controlled trial

Public title

Tacrolimus with extended release in kidney transplant

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria:

All patients at this center have received a kidney transplant from a deceased and brain-dead donor Adult recipients (age ≥ 18 years) undergoing their first kidney transplant. Willingness and ability to provide written informed consent as they are to receive a tacrolimus-based immunosuppressive regimen.

Exclusion criteria:

Recipients of multiple organ transplants Patients undergoing retransplantation Known sensitivity to tacrolimus or its excipients ABO blood group incompatible transplant Pregnant or lactating women Desire to use a specific dosage form of Tacrolimus

Age

From **18 years** old

Gender

Both

Phase

3

Groups that have been masked

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

Sample size

Target sample size: **200**

Randomization (investigator's opinion)

Randomized

Randomization description

Participants will be randomly allocated in a 1:1 ratio to one of two treatment groups using block randomization with permuted blocks of four. The six possible block permutations (AABB, ABAB, ABBA, BBAA, BABA, BAAB) will be used. Random numbers will be generated from a random number table, with numbers 1–6 corresponding to the block permutations; numbers 0, 7, 8, and 9 will be disregarded. Randomization will continue until the full sample size is assigned. The unit of randomization will be the individual participant. No stratified randomization will be applied. The randomization sequence will be generated in advance and used at enrollment. Allocation concealment will be maintained using the pre-generated randomization sequence.

Blinding (investigator's opinion)

Double blinded

Blinding description

This study is conducted as a double-blind randomized controlled trial. Study participants are blinded to treatment allocation and are not informed whether they receive extended-release tacrolimus (Advagraf®) or immediate-release tacrolimus (Prograf®). The principal investigator and all healthcare providers involved in patient care, including physicians and nurses, are blinded to group assignment throughout the study period. Randomization is performed using a pre-generated allocation sequence, which is kept confidential and is not accessible to investigators, healthcare providers, data collectors, or outcome assessors.

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics committee of shiraz university of medical sciences

Street address

Imam Hossein Square, Zand Street, Shiraz

City

Shiraz

Province

Fars

Postal code

7134845794

Approval date

2025-12-24, 1404/10/03

Ethics committee reference number

IR.SUMS.MED.REC.1404.524

Health conditions studied

1

Description of health condition studied

Kidney transplantation in adult recipients receiving tacrolimus based immunosuppressive therapy during the early post transplantation period.

ICD-10 code

Z94.0

ICD-10 code description

Kidney transplant status

Primary outcomes

1

Description
Incidence of biopsy proven acute rejection within the first month after kidney transplantation.
Timepoint
During the first four weeks after kidney transplantation.
Method of measurement
For cause kidney biopsy performed in cases of suspected acute rejection or unexplained increase in serum creatinine, with histopathological confirmation by a transplant pathologist.

Secondary outcomes

1

Description
Renal graft function assessed by serum creatinine level.
Timepoint
Day 1, Day 2, Week 1, Week 2, Week 3, and Week 4 after kidney transplantation.
Method of measurement
Serum creatinine measured using standard laboratory methods.

Intervention groups

1

Description
Intervention group: Participants receive once daily extended release tacrolimus (Advagraf®, Astellas) at a starting dose of 5 milligrams per day as part of a standardized immunosuppressive regimen including anti-thymocyte globulin induction, oral prednisolone tapering, and either mycophenolate mofetil or mycophenolic acid. Dose adjustments are based on target trough blood levels of 8 to 10 nanograms per milliliter.
Category
Treatment - Drugs

2

Description
Control group: Participants receive twice daily immediate release tacrolimus (Prograf®, Astellas) at a starting dose of 2 milligrams twice daily in the same standardized immunosuppressive regimen. Dose adjustments are based on target trough blood levels of 8 to 10 nanograms per milliliter.
Category
Treatment - Drugs

Recruitment centers

1

Recruitment center
Name of recruitment center
Abu Ali Sina Hospital, Shiraz Transplant Center
Full name of responsible person
Nakisa Rasaei
Street address
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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Shiraz University of Medical Sciences
Full name of responsible person
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Zand blvd, Shiraz
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Postal code
7134814336
Phone
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Email
mohammadi219@gmail.com
Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
Shiraz 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
Shiraz University of Medical Sciences
Full name of responsible person
Nakisa Rasaei
Position

Assistant Professor
Latest degree
Subspecialist
Other areas of specialty/work
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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 data set including demographic variables, baseline clinical characteristics, intervention assignment, primary and secondary outcome measures collected during the first month after kidney transplantation.
When the data will become available and for how long
The data will become available starting a few months after publication of the main study results
To whom data/document is available
Deidentified data will be available to qualified researchers affiliated with academic or research institutions.
Under which criteria data/document could be used
Data will be shared for scientific research purposes only. Requests must include a clear research proposal and will be reviewed by the principal investigator. Data use is limited to analyses consistent with the approved proposal.
From where data/document is obtainable
Requests should be submitted via email to the principal investigator at Shiraz University of Medical Sciences. Communication will be conducted primarily by email. Email: nakisarasaei@gmail.com
What processes are involved for a request to access data/document
Applicants must submit a written request including study objectives and analysis plan. Requests will be reviewed within approximately 2 weeks, and approved data will be shared after signing a data use agreement.
Comments