Clinical Trial Protocol
Iranian Registry of Clinical Trials

17 Sep 2026

Comparing the effect of isometric and isotonic hand exercises on AVF maturation in patients with chronic renal failure

Protocol summary

Study aim

Comparison of the effect of isometric and isotonic hand exercises on the maturation of arteriovenous fistula in patients requiring hemodialysis

Design

Personal information and disease characteristics (age, ..., smoking, high blood lipids, history of CVA, trauma, previous surgeries, cause of underlying kidney disease, pulses, blood pressure and edema, variables related to surgery such as the use of heparin during surgery, the presence of a trill on palpation or a murmur on auscultation after surgery) will be recorded. After random allocation, they will be trained for 4 weeks.

Settings and conduct

In addition to practical training, brochures will be provided to patients and their adherence to sports will be checked by phone calls. Before and after the intervention, Arterio-Venous Fistula maturation using ultrasound and physical examination will be evaluated and compared between the groups.

Participants/Inclusion and exclusion criteria

diagnosed with End Stage of Renal Disease, undergone Arterio-Venous Fistula surgery for the first time, age range of 18 years and above. Patients who cannot be followed up, have a history of trauma and surgery and reduced movement in their hands will be excluded.

Intervention groups

After surgery, the control group receive routine general training. In the first intervention group, consistent isometric exercises will be designed by a sports medicine specialist. In the second intervention group, isotonic exercises will be performed using a wrist strengthening spring and a wrist strengthening ring.

Main outcome variables

Arteriovenous Fistula maturation

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20230312057690N1**
Registration date: **2023-04-17, 1402/01/28**
Registration timing: **prospective**

Last update: **2023-04-17, 1402/01/28**
Update count: **0**

Registration date

2023-04-17, 1402/01/28

Registrant information

Name

Azita jaberi

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 71 3647 4255

Email address

azita635@yahoo.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2023-08-23, 1402/06/01

Expected recruitment end date

2024-05-21, 1403/03/01

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparing the effect of isometric and isotonic hand exercises on AVF maturation in patients with chronic renal failure

Public title
Comparing the effect of isometric and isotonic hand exercises on AVF maturation in patients with chronic renal failure
Purpose
Education/Guidance
Inclusion/Exclusion criteria
Inclusion criteria:
diagnosed with ESRD AVF done for the first time 18 years old and older
Exclusion criteria:
Age
From **18 years** old
Gender
Both

Phase
N/A
Groups that have been masked

- Data analyser

Sample size
Target sample size: **75**
Randomization (investigator's opinion)
Randomized
Randomization description
Using the random numbers table, the participants will be recruited into the control and intervention groups. For this purpose, the researchers give a code to the members of the community, and since the number of members of the community is two digits, they give a two-digit code. Then they randomly start from a table point in the row direction. According to the type of digits of the codes (two digits), they will select the same number of digits in the direction of the table row. After reaching the desired house, they will choose a number smaller than the number of the population under study. The selected number is actually the code of an individual from the community that is selected as a sample. This work should continue until the number of sample people can be selected.
Blinding (investigator's opinion)
Single blinded
Blinding description
The analyzer of the outcomes will not be informed about the treatment assignments, this means that when presenting the data to her/him, the questionnaires have only one number and it is not clear which group each of these questionnaires belong to.
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
İamazi square
City
shiraz
Province
Fars
Postal code
7168783399
Approval date
2023-01-21, 1401/11/01
Ethics committee reference number
IR.SUMS.NUMIMG.REC.1401.116

Health conditions studied

1

Description of health condition studied
ESRD
ICD-10 code
N18.4
ICD-10 code description
Chronic kidney disease, stage 4 (severe)

Primary outcomes

1

Description
AVF maturation
Timepoint
before and after intervention
Method of measurement
Ultrasonography and physical exam

Secondary outcomes

empty

Intervention groups

1

Description
Intervention group1: Isometric exercises: It will be designed by a sports medicine specialist. This exercise program starts in the department under the supervision of a doctor 2 days after surgery and should be continued four times a day for 3 days a week. This exercise program starts with a low intensity 4 times a day (2 times in the morning and 2 times in the evening) in the form of pressing a tennis ball and exercising with dumbbells (half to one kilogram) and pulling bands, and the intensity of these exercises will increase in the following days.
Category

Rehabilitation

2

Description

Intervention group2: Isotonic exercises: It will be done using a wrist strengthening spring and a wrist strengthening ring approved by a doctor and sports medicine specialist. In these patients, two days after the surgery, sports are started under the supervision of a doctor. In this way, in the first week, the patients are asked to squeeze and open the wrist strengthening ring 10 to 30 times per minute and repeat this 6 times a day, leaving at least 90 seconds between each set. In the 2nd week, the same thing should be done with the wrist strengthening spring, and in the 3rd and 4th weeks, each set will be increased to a minute.

Category

Rehabilitation

3

Description

Control group: After surgery, they receive general training such as not to do hard work, not to take blood and blood pressure samples from the hand, and to do exercise using a plastic ball. This group performs the exercises 10 times, rests for one minute, and again ten times, rests for one minute, and presses the ball ten times for the third time. This group is asked to do this twice in the morning and twice in the evening. If there are no signs of infection, abscess, inflammation, pain and tenderness in the surgery site, these exercises will start 24 hours after the surgery.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Namazi hospital

Full name of responsible person

Zinat Mohebbi

Street address

Namazi Square

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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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Grant name

A comparative study of the effect of isometric and isotonic hand exercises on the maturation of arteriovenous fistula in patients requiring hemodialysis

Grant code / Reference number

27403

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

Zinat Mohebbi

Position

Faculty member

Latest degree

Ph.D.

Other areas of specialty/work

Nursery

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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
ethical considerations
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
Yes - There is 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
Title and more details about the data/document
Participant data regarding the main outcomes that underline the results reported in the article, after deidentification (text, tables, figures and appendices)
When the data will become available and for how long
begining 3 months and ending 36 months after publishing the article
To whom data/document is available
Researchers whose proposed use of the data was approved by an ethical committee and related to this study.
Under which criteria data/document could be used
for research purposes/ if the topic was in line with the present study
From where data/document is obtainable
Information regarding submitting proposal and accessing data may be found at https://research.sums.ac.ir/
What processes are involved for a request to access data/document
no need
Comments
proposals may be submitted up to 36 months following article publication to Shiraz University of Medical Sciences https://research.sums.ac.ir/