

Clinical Trial Protocol

Iranian Registry of Clinical Trials

30 May 2026

Mesenchymal Stem Cell Therapy for Acute Respiratory Distress Syndrome in Coronavirus Infection: A Phase 2-3 Clinical Trial

Protocol summary

Study aim

The main objective is to investigate the safety and efficacy of cell therapy in patients with ARDS caused by Coronavirus pneumonia as an open-labeled randomized clinical trial.

Design

A controlled randomized clinical trial phase 2-3

Settings and conduct

The study will be conducted at Masih Daneshvari Hospital and Shariati Hospital. Participants, outcome assessors, and analyzers are unaware of the allocation of study groups.

Participants/Inclusion and exclusion criteria

Patients aged 18 to 65 years are included in the study with a definitive diagnosis of COVID-19, which subsequently develops acute respiratory distress syndrome (mild or moderate). COVID-19 patients with severe underlying disease or allergies to the cell or its associated compounds are not included in the study.

Intervention groups

The patients allocated randomly to three groups: 1) Intervention 1, Patients will receive two doses of MSCs. 2) Intervention 2, Patients will receive two doses of MSCs intravenously plus two doses of EVs. 3) Control, Patients will receive conventional therapy.

Main outcome variables

Safety ; Blood oxygen saturation; Decreased severity of pneumonia; Improvement of the acute respiratory syndrome

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20200217046526N2**

Registration date: **2020-04-13, 1399/01/25**

Registration timing: **registered_while_recruiting**

Last update: **2020-04-13, 1399/01/25**

Update count: **0**

Registration date

2020-04-13, 1399/01/25

Registrant information

Name

Masoumeh Nouri

Name of organization / entity

Royan Stem Cell Technology Co

Country

Iran (Islamic Republic of)

Phone

+98 21 2763 5512

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m.nouri@rsct.ir

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2020-04-05, 1399/01/17

Expected recruitment end date

2020-06-06, 1399/03/17

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Mesenchymal Stem Cell Therapy for Acute Respiratory Distress Syndrome in Coronavirus Infection: A Phase 2-3 Clinical Trial

Public title

Mesenchymal Stem Cell Therapy for Acute Respiratory Distress Syndrome in Coronavirus Infection

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria:

Confirmation of 2019-nCoV infection by RT-PCR
Diagnosis of ARDS according to the Berlin definition of ARDS Requiring supplemental oxygen, OR Pneumonia that is judged by chest radiograph or CT PaO₂/oxygen absorption concentration (FiO₂) ≤ 300MMHG Pulmonary imaging shows that the focused progress > 50% in 24-48 hours Mild to Moderate 2019-nCoV pneumonia/ stay in the ICU <48 hours SOFA score between 2-3 point

Exclusion criteria:

Severe allergies or allergies after 1st injection to stem cell preparations and their components Patients with a malignant tumor, other serious systemic diseases, and psychosis Co-Infection of HIV, tuberculosis, influenza virus, adenovirus and other respiratory infection virus Patients with previous history of pulmonary embolism Be thought by researchers to be inappropriate to participate in this clinical study (Expected deaths within 48 hours, uncontrolled infections) Liver or kidney SOFA score of more than 3 points; combined with other organ failure (need organ support), Stage 4 severe chronic kidney disease or requiring dialysis (i.e. estimated glomerular filtration rate (eGFR) < 30) Pulmonary obstructive pneumonia, severe pulmonary interstitial fibrosis, alveolar proteinosis, allergic alveolitis, and other known viral pneumonia or bacterial pneumonia Continuous use of immunosuppressive agents or organ transplants in the past 6 months In vitro life support (ECMO, ECCO2R, RRT) Pregnant or lactating women Uncontrolled underlying disease

Age

From **18 years** old to **65 years** old

Gender

Both

Phase

2-3

Groups that have been masked

No information

Sample size

Target sample size: **60**

Randomization (investigator's opinion)

Randomized

Randomization description

Participants were randomly divided into three equal groups using a randomized tripled ABC blocking method based on a random number table.

Blinding (investigator's opinion)

Not blinded

Blinding description

Placebo

Not used

Assignment

Parallel

Other design features

The study will be done for the first ten of each intervention and then for the second ten of each intervention groups.

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethic committee of National Institute for Medical Research Development

Street address

No 21, Besat Street., Western Fatimid Street

City

Tehran

Province

Tehran

Postal code

۱۴۱۹۶۹۳۱۱۱

Approval date

2020-03-12, 1398/12/22

Ethics committee reference number

IR.NIMAD.REC.1398.412

Health conditions studied

1

Description of health condition studied

Acute Respiratory Distress Syndrome of COVID-19

ICD-10 code

U07.1

ICD-10 code description

COVID-19

Primary outcomes

1

Description

Adverse events assesment

Timepoint

At the same time of each intervention, 24 hours after each intervention, on days 6, 7, 14 and 28 after the first intervention

Method of measurement

Number of participants with treatment-related adverse events as assessed by CTCAE v4.0

2

Description

Blood oxygen saturation

Timepoint

At Baseline, simultaneously with each intervention and on days 5, 6, 7, 14 after the first intervention

Method of measurement

Evaluation of Pneumonia Improvement

Secondary outcomes

1

Description

Biomarkers concentrations in plasma

Timepoint

At baseline, 7, 14, 28 days after the first intervention

Method of measurement

Biochemical examination

2

Description

Respiratory efficacy

Timepoint

From baseline to day 7

Method of measurement

Evaluated by the increase in PaO₂/FiO₂ ratio

3

Description

Intensive care unit-free days

Timepoint

Up to day 8

Method of measurement

Number of day

4

Description

Change in clinical symptoms

Timepoint

At Baseline, simultaneously with each intervention and on days 5, 6, 7, 14 after the first intervention

Method of measurement

Evaluation of Pneumonia Improvement

Intervention groups

1

Description

Intervention group: The intervention group 1, Patients will receive three doses of MSCs. Two doses of 100×10⁶ (±10%) cells will intravenously infuse as a normally dropped single dose over 10-12 minutes at the infusion speed of 4-5 mL/minute in day 0 and day 2.

Category

Treatment - Other

2

Description

The intervention group 3, Patients will receive two doses of MSCs intravenously and EVs. Two doses of 100×10⁶ (±10%) MSCs will intravenously infuse as a normally dropped single dose over 10-12 minutes at the infusion speed of 4-5 mL/minute in day 0 and day 2. In days 4 and 6, the patients will receive two times the infusion of MSCs-EVs.

Category

Treatment - Other

3

Description

Control group: Patients will receive conventional therapy

Category

Treatment - Other

Recruitment centers

1

Recruitment center

Name of recruitment center

Masih Daneshvari Hospital

Full name of responsible person

Mohammad Reza Hashemian

Street address

Masih Daneshvari Hospital., Darabad Avenue., Shahid Bahonar Avenue

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2

Recruitment center

Name of recruitment center

Shariati hospital

Full name of responsible person

Rasoul Alian Nejad

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Iranian academic center for education culture and research

Full name of responsible person

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shahverdi@royaninstitute.org
Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
Iranian academic center for education culture and research
Proportion provided by this source
50
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

2

Sponsor
Name of organization / entity
National Institute for Medical Research Development
Full name of responsible person
Reza Mlekzadeh
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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
National Institute for Medical Research Development
Proportion provided by this source
50
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
Royan Institute
Full name of responsible person
Morteza Zarrabi
Position
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Latest degree
Specialist
Other areas of specialty/work
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Person responsible for scientific inquiries

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Person responsible for updating data

Contact

Name of organization / entity
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Full name of responsible person
Masoume Nouri

Position

R&D Responsible

Latest degree

Ph.D.

Other areas of specialty/work

Cell Therapy

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masoume.nouri2002@gmail.com

Sharing plan**Deidentified Individual Participant Data Set (IPD)**

Yes - There is a plan to make this available

Study Protocol

Undecided - It is not yet known if there will be a plan to make this available

Statistical Analysis Plan

Undecided - It is not yet known if there will be a plan to make this available

Informed Consent Form

Undecided - It is not yet known if there will be a plan to make this available

Clinical Study Report

Undecided - It is not yet known if there will be a plan to make this available

Analytic Code

Undecided - It is not yet known if there will be a plan to make this available

Data Dictionary

Undecided - It is not yet known if there will be a plan to make this available

Title and more details about the data/document

All collected deidentified IPD can be shared

When the data will become available and for how long

6 months after publication

To whom data/document is available

Researchers and clinicians

Under which criteria data/document could be used

Planning of similar studies in other academic centers

From where data/document is obtainable

Email

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

1-2 months after request

Comments