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 tree groups: 1) Intervention 1, Patients will receive two doses of MSCs. 3) 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
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Iran (Islamic Republic of)
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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 underling 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

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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 100×10e6 (±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 100×10e6 (±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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Shariati Hospital., Jalal-e-Al-e-Ahmad Hwy

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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

Abdol Hossein Shahverdi

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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
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
Associate professor

Latest degree
Specialist

Other areas of specialty/work
Cell Therapy

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Person responsible for updating data

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Name of organization / entity
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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
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