

Inhibition of cardiac fibrosis by colchicine in acute myocardial infarction

Submission date 28/12/2023	Recruitment status No longer recruiting	<input type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
Registration date 02/01/2024	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
Last Edited 02/02/2026	Condition category Circulatory System	<input type="checkbox"/> Individual participant data

Plain English summary of protocol

Background and study aims

When your heart is injured due to a serious heart attack, it sets off an immediate inflammatory response. If the blood flow isn't quickly restored, the damaged tissue can turn into scar tissue. In people with a specific kind of heart attack, called STEMI, restoring blood flow promptly is crucial to minimize damage. This can be done either by using a procedure called PCI or by using fibrinolytic therapy.

Sometimes, even when the blood flow is restored, there can be ongoing damage to the heart tissue. This damage involves changes in tiny structures within the cells, leading to inflammation. Certain cells in the immune system, called macrophages, get involved, releasing substances that either promote or reduce inflammation. In this study, we're looking at a drug called colchicine, known for its anti-inflammatory properties. It seems that colchicine may not only reduce inflammation but also prevent the formation of excess scar tissue in the heart.

Our goal is to understand how colchicine affects specific processes in the body after a heart attack, particularly in patients who undergo a procedure to restore blood flow. We're investigating whether colchicine can decrease the harmful effects of inflammation, promote healing, and potentially prevent heart failure from developing. We're also using a substance called NT-proBNP to help us understand the extent of heart damage. By doing this research, we hope to find new ways to improve outcomes for people who experience this type of heart attack.

Who can participate?

Patients aged 30-75 years, diagnosed with acute myocardial infarction, who have undergone reperfusion therapy and are receiving colchicine treatment in addition to the standard of care, and meet the inclusion criteria.

What does the study involve?

The study involves administering colchicine to reduce cardiac fibrosis by increasing levels of IL-10 and galectin-3 and reducing the ratio of collagen I to collagen III and NT-proBNP. The treatment's effectiveness will be assessed using various biomarkers and echocardiography.

What are the possible benefits and risks of participating?

The benefits of participating in this study include the potential reduction of fibrosis and anti-remodeling effects. However, there are risks involved, such as side effects from colchicine, including nausea, diarrhoea, and gastritis.

Where is the study run from?

Ciputra University (Indonesia)

When is the study starting and how long is it expected to run for?

November 2020 to December 2023

Who is funding the study?

Investigator initiated and funded

Who is the main contact?

Dr Saskia Dyah Handari, saskiadyahandari@gmail.com.

Contact information

Type(s)

Public, Scientific, Principal investigator

Contact name

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Additional identifiers

Protocol serial number

Ethical approval No : 400/K.3/302/2020

Study information

Scientific Title

Inhibition of cardiac fibrosis by colchicine through differential increase in interleukin-10 and galectin-3 expression and decrease in the ratio of collagen I to collagen III and NT-proBNP in acute myocardial infarction (in vivo study on patients with acute myocardial infarction with ST-segment elevation undergoing primary and delayed percutaneous coronary intervention)

Acronym

ICFC-AMI

Study objectives

It is hypothesized that there is a difference in the effect of colchicine administration in inhibiting cardiac fibrosis through an increase in IL-10 and galectin-3 levels, and a decrease in the ratio of collagen I to collagen III, evaluated by PIIINP (Procollagen 3 N-terminal peptide) and NT-proBNP (N-terminal pro b-type natriuretic peptide), in patients with acute myocardial infarction with ST-segment elevation (STEMI) undergoing primary and delayed percutaneous coronary intervention

Ethics approval required

Ethics approval required

Ethics approval(s)

approved 05/11/2020, Health Research Ethics Committee. General Hospital Dr. Saiful Anwar Malang (Jl. Jaks Agung Suprpto no 2. Malang, Malang, 65111, Indonesia; +62 (0)341362101; staf-rsu-drsaifulanwar@jatimprov.go.id), ref: 400/K.3/302/2020

Study design

Randomized controlled trial

Primary study design

Interventional

Study type(s)

Treatment

Health condition(s) or problem(s) studied

Acute myocardial infarction

Interventions

Patients undergoing primary and delayed percutaneous coronary intervention (PCI) are divided into two groups for each PCI type. Sample selection is through consecutive sampling, and randomization is 1:1 with double-blind allocation.

Primary PCI patients:

1. One group receives a loading dose of 1 mg colchicine 1-2 hours before the PCI procedure, followed by 0.5 mg 1 hour afterwards, and a maintenance dose of 0.5 mg daily for 1 month, along with optimal medical therapy.
2. The other group receives a placebo following the same regimen and optimal medical therapy for 1 month.

Delayed PCI Patients:

1. One group receives a loading dose of 1 mg colchicine 1-2 hours before the PCI procedure, followed by 0.5 mg 1 hour afterwards, and a maintenance dose of 0.5 mg daily for 1 month, along with optimal medical therapy.
2. The other group receives a placebo following the same regimen and optimal medical therapy for 1 month.

This design allows the researchers to observe the effects of colchicine in comparison to placebo in patients undergoing different timings of PCI while ensuring that all groups receive the standard care.

Intervention Type

Drug

Phase

Not Applicable

Drug/device/biological/vaccine name(s)

Colchicine

Primary outcome(s)

Left ventricular remodelling measured using echocardiography during hospitalization and 1 month post-hospitalization

Key secondary outcome(s)

Biomarkers (Gal3, IL10, PIIINP and NTProBNP) measured during hospitalization and 1 month post-hospitalization

Completion date

20/12/2023

Eligibility

Key inclusion criteria

1. Patients diagnosed with STEMI for the first time, with the following diagnostic criteria: persistent typical chest pain >30 minutes lasting more than 12 hours, accompanied by ST-segment elevation in at least 2 contiguous leads, and an increase in cardiac enzymes, troponin I.
2. Patients who have received information about the study and signed an informed consent.
3. Patients not pregnant, breastfeeding, or planning pregnancy during the study period.
4. Patients without a history of alcohol abuse.
5. Patients not receiving long-term steroid therapy during the study.
6. Patients not currently taking colchicine for other indications (e.g., gout arthritis, familial Mediterranean fever).

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Mixed

Lower age limit

30 years

Upper age limit

75 years

Sex

All

Total final enrolment

200

Key exclusion criteria

1. Patients with poor medication adherence, as evidenced by the number of missed doses during the study.
2. Patients with a history of hypersensitivity to colchicine.
3. Patients with comorbidities such as infections, inflammation, malignancy, for instance, irritable bowel syndrome (Crohn's Disease or ulcerative colitis), severe renal failure (eGFR <30), a history of hepatic cirrhosis, acute exacerbation of hepatitis, or severe liver disease.
4. Laboratory results as follows: Hemoglobin <11.5g/dl, Leukocytes < 3.0 x 10⁹/L, Platelets < 110 x 10⁹/L, ALT > 3 times the upper normal limit, Total Bilirubin > 2 times the upper normal limit, Creatinine > 2 times the upper normal limit.
5. Patients who have experienced cardiac arrest.
6. Patients with ventricular fibrillation.
7. Patients with cardiogenic shock or unstable hemodynamics.

Date of first enrolment

20/09/2022

Date of final enrolment

20/02/2023

Locations**Countries of recruitment**

Indonesia

Study participating centre

Cardiovascular Research Centre Medical Faculty of Brawijaya University

Jl. Veteran, Ketawanggede, Kecamatan Lowokwaru, Kota Malang, Jawa Timur

Malang

Indonesia

65145

Sponsor information**Organisation**

University of Brawijaya

ROR

<https://ror.org/01wk3d929>

Funder(s)

Funder type

Other

Funder Name

Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan

All data generated or analysed during this study will be included in the subsequent results publication

IPD sharing plan summary

Published as a supplement to the results publication

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		20/01/2025	02/02/2026	Yes	No
Results article		06/08/2024	02/02/2026	Yes	No
Preprint results		23/12/2024	02/01/2025	No	No