

Precise evaluation of myocardial damage by cardiac MRI – QUIEROMR

Submission date 26/10/2020	Recruitment status No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
Registration date 08/12/2020	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
Last Edited 15/01/2021	Condition category Circulatory System	<input type="checkbox"/> Individual participant data <input type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

Nearly 20 years ago researchers proved that it is possible to detect subtle changes in the myocardium (heart muscle) using cardiac MRI (CMR). Many disorders affecting the heart lead to a replacement of normal cells by fibrous tissue. Using CMR this process can be seen by applying a contrast agent to detect so-called late gadolinium enhancement (LGE). This method is considered to be the reference method for the detection of myocardial scars. This method has two major drawbacks: it is highly operator dependent and subjective, on patients with reduced kidney function are often excluded from contrast-based scans. To tackle these obstacles parametric techniques have been developed to assess myocardial damage with quantitative markers (e.g. T1 and T2 values). Previous studies could show that these tissue markers have diagnostic, therapeutic and prognostic implications. At the moment a separate scan has to be performed for each marker, taking more time and making a complete coverage of the ventricle impossible. The aim of this study is to assess new parametric techniques that acquire more than one parameter at a time in various heart diseases. The researchers expect to precisely detect myocardial damage in a shorter time. The study is organized under the HORIZON2020 Project QUIERO (Quantitative Imaging Enables Reproducible Outcomes) EU Grant Nr. 18HLT05.

Who can participate?

Patients aged at least 18 with one of the following heart diseases: ischemic heart disease (acute, subacute and chronic stages), rheumatological disorders with cardiac involvement, aortic stenosis, hypertrophic cardiomyopathy. Healthy volunteers aged at least 18 without any heart, kidney, lung or systemic disorders

What does the study involve?

All patients receive one MRI scan. Patients will be scanned before and after contrast agent application similar to a routine CMR scan. Healthy volunteers will be scanned without the use of contrast agent. Participants also provide blood samples and an ECG is recorded before the MRI scan.

What are the benefits and risk of participating?

Healthy volunteers and patients will receive a short description of their heart function with or without the description of myocardial scars.

Where is the study run from?
Charité Universitätsmedizin Berlin (Germany)

When is the study starting and how long is it expected to run for?
February 2020 to May 2022

Who is funding the study?
Charité Universitätsmedizin Berlin (Germany)

Who is the main contact?
Prof. Jeanette Schulz-Menger
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Contact information

Type(s)
Scientific

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

Protocol serial number
Nil known

Study information

Scientific Title
Quantitative analysis of myocardial damage in patients with focal and diffuse fibrosis by applying novel parametric mapping techniques in cardiac magnetic resonance

Acronym
QUIEROMR

Study objectives

1. Multi-parametric sequences allow the precise quantification of myocardial damage. There is no clinically relevant difference regarding the detection of focal and diffuse fibrosis by native T1 values obtained by multi-parametric sequences in comparison to reference methods.
2. Multi-parametric sequences allow the precise quantification of myocardial edema. There is no clinically relevant difference regarding the detection of myocardial edema by T2 values obtained by multi-parametric sequences in comparison to reference methods.

Ethics approval required

Old ethics approval format

Ethics approval(s)

Approved 30/09/2020, ethics committee of Charité University Medicine Berlin Campus Mitte (Charité Medical Faculty, Charité – Universitätsmedizin Berlin, Campus Charité Mitte, Charitéplatz 1, 10117 Berlin, Germany; +49 (0)30 450 517 222; ethikkommission@charite.de), ref: EA4/166/20

Study design

Observational single-center cohort study

Primary study design

Observational

Study type(s)

Diagnostic

Health condition(s) or problem(s) studied

Diffuse and focal fibrosis in patients with cardiovascular disorders

Interventions

Patients are scanned once to assess possible focal or diffuse fibrosis using quantitative imaging techniques in cardiac MRI. Blood analysis is carried out before the MRI scan to measure NTproBNP, high-sensitive Troponin T, hematocrit, glomerular filtration rate. Physical exam of the cardiovascular apparatus and an ECG are carried out before the MRI scan as well.

Intervention Type

Device

Phase

Not Applicable

Primary outcome(s)

Myocardial T1 and T2 times, measured using novel and reference parametric mapping techniques once during the CMR scan (single timepoint)

Key secondary outcome(s)

1. Detection and size of myocardial fibrosis using late gadolinium enhancement techniques and extracellular volume (ECV) by applying CMR once (single timepoint)
2. Time for each acquisition and per slice measured using the DICOM tags after images are obtained

Completion date

31/05/2022

Eligibility

Key inclusion criteria

1. Signed consent
2. Age at least 18 years (no upper limit)
3. For patients: previously detected pathology on MRI including: ischemic heart disease (acute, subacute and chronic stages), rheumatological disorders with cardiac manifestations, aortic stenosis, hypertrophic cardiomyopathy
4. For healthy volunteers: absence of cardiac, pulmonary, renal or systemic disorders

Participant type(s)

Mixed

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 years

Sex

All

Key exclusion criteria

1. Any contraindication for MRI
2. Chronic renal failure (glomerular filtration rate <30ml/min)
3. Previous participation in this study
4. Known allergy against MRI contrast agent
5. Pregnancy

Date of first enrolment

01/01/2021

Date of final enrolment

31/12/2021

Locations

Countries of recruitment

Germany

Study participating centre

Charité University Medicine Berlin
Lindenberger Weg 80
Berlin
Germany
13125

Study participating centre
Max-Delbrueck Center for Molecular Medicine
Robert-Rössle-Straße 10
Berlin
Germany
13125

Study participating centre
HELIOS Klinikum Berlin Buch
Department of Cardiology and Nephrology
Berlin
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13125

Sponsor information

Organisation
Charité

ROR
<https://ror.org/001w7jn25>

Funder(s)

Funder type
Hospital/treatment centre

Funder Name
Charité – Universitätsmedizin Berlin

Alternative Name(s)
Medical School - Charité - University Medicine Berlin

Funding Body Type

Private sector organisation

Funding Body Subtype

For-profit companies (industry)

Location

Germany

Results and Publications

Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are not expected to be made available due to data protection laws in Germany. However, upon request the methodology and dataset structure can be shared.

IPD sharing plan summary

Not expected to be made available

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Study website	Study website	11/11/2025	11/11/2025	No	Yes