CARdiomyopathy in type 2 DIAbetes mellitus

Published: 18-05-2020
Last updated: 19-08-2024

To assess the uniqueness of diabetic cardiomyopathy (DCM) relative to other forms of cardiomyopathy using unsupervised clustering approaches based on deep phenotyping (clinical, imaging and biological) information. With the results of this study we...

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Heart failures
Study type	Observational invasive

Summary

ID

NL-OMON52382

Source
ToetsingOnline

Brief title
CARDIATEAM

Condition

- Heart failures
- Diabetic complications

Synonym
Diabetic cardiomyopathy, heart failure induced by diabetes

Research involving
Human

Sponsors and support

Primary sponsor: Medisch Universitair Ziekenhuis Maastricht
Source(s) of monetary or material Support: Europese Unie;NLHI

Intervention

Keyword: diabetes, diabetic cardiomyopathy, heart failure, preserved ejection fraction

Outcome measures

Primary outcome

The main study parameter is quality of the phenotypic clustering analysis, as assessed by the measurement of between-clusters overlap (<10% target), connectivity, stability and within-clusters compactness. The 3 year follow-up data of cardiovascular events will provide crucial information to assess the clinical relevance and prognostic value of identified clusters.

Secondary outcome

- To enrich the phenomapping with complementary multi-OMICs information to evaluate their added value for discriminating between clusters.

- To identify the best clinical, biological, imaging and multi-OMICs predictors of belonging to the DCM cluster (diagnostic perspective).

- To explore the pathophysiological and causal pathways characterizing DCM, in order to better understand the underlying mechanisms responsible for establishment and progression of disease.

- To assess the predictive value of the DCM cluster identified for overall survival and cardiovascular events (prognostic perspective)

Study description

Background summary

In recent decades it has become clear that there is a relationship between type 2 diabetes mellitus (T2DM) and heart failure (HF). Although not all patients

with T2DM develop a cardiomyopathy or progress to HF, they are more than 2.5 times more likely than non-diabetic patients to present with myocardial dysfunction and progression to HF. The simultaneous presence of confounders such as hypertension, obesity, systemic inflammation and certain genetic disorders makes it difficult to objectify the specific contribution of the glucometabolic state to myocardial dysfunction. The hypothesis is that diabetic cardiomyopathy (DCM) is the result of deregulation of a specific, to be identified, signalling pathway that leads to a particular cardiac dysfunction which is different from other forms of HF.

Study objective

To assess the uniqueness of diabetic cardiomyopathy (DCM) relative to other forms of cardiomyopathy using unsupervised clustering approaches based on deep phenotyping (clinical, imaging and biological) information. With the results of this study we aim to improve the clinical care of T2DM patients by discovering new opportunities for personalized preventive and therapeutic strategies.

Study design

CARDIATEAM is a prospective, multicenter and multinational cohort study.

Study burden and risks

There is minimum risk associated with this study. For more details please see study protocol *10.5 Benefits and risks assessment, group relatedness*

Contacts

Public
Medisch Universitair Ziekenhuis Maastricht

P. Debyelaan 25
Maastricht 6229 HX
NL
Scientific
Medisch Universitair Ziekenhuis Maastricht

P. Debyelaan 25
Maastricht 6229 HX
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)

Inclusion criteria

In order to be eligible to participate in this study, a subject must meet all of the following criteria:
* Female or male, aged between >= 40 and <=80 years
* Normal LVEF AND absence of akinetic segment assessed by echocardiography (i.e. LVEF>=50%)
* For each group, the diagnosis will be based on current accepted criteria [7, 8] :
o HFpEF: left ventricular ejection fraction (LVEF) LVEF>=50% AND presence/or history of symptoms (e.g. breathlessness, ankle swelling and fatigue) or signs (e.g. elevated jugular venous pressure, pulmonary crackles and peripheral oedema) of heart failure AND significant diastolic dysfunction (left atrial volume index >34 mL/m2 or a LVMI >=115 g/m2 for males and >=95 g/m2 for female, E/e* >=13 and e* <9 cm/s) OR NT-proBNP >125 pg/mL
o No HFpEF: LVEF>=50% AND absence of symptoms (e.g. breathlessness, ankle swelling and fatigue) or signs (e.g. elevated jugular venous pressure, pulmonary crackles and peripheral oedema) of heart failure
o T2DM: HbA1c >=6.5% (>=48 mmol/L) AND Fasting Plasma Glucose >=7.0 mmol/L (>=126 mg/dL) or anti-diabetic treatment
o Non T2DM: HbA1c < 6.5% AND Fasting Plasma Glucose <7.0 mmol/L without any anti-diabetic treatment including normoglycemic subjects
o HCM: patients with non-obstructive HCM of sarcomeric cause (proven with common genetic cause) and with LV wall thickness >= 15 mm in one or more myocardial segments in the absence of abnormal afterload conditions.
* Suitable echocardiographic window
* Absence of history of coronary artery disease including history of myocardial ischaemia, myocardial infarction or percutaneous coronary intervention
* Absence of significant coronary artery disease (CAD) defined as
o the absence of coronary artery stenosis >=50% on a cardiac computed tomography (CT) OR a coronary angiography OR normal Fractional Flow Reserve (FFR >0.80) OR Coronary Artery Calcium score (CAC) < 100 performed within the 24 months before

inclusion. Coronary CT and/or stress tests will not be performed as part of the study in the Dutch centers. Only patient in which the absence of CAD has previously been confirmed by this definition (due to clinical indication) will be included.
* Patient covered by a health insurance

Exclusion criteria

A potential subject who meets any of the following criteria will be excluded from participation in this study:
* Diabetes mellitus other than type 2 (type 1, LADA, MODY, NODAT, etc.)
* Suboptimal echocardiographic window
* Significant valvular heart disease defined as severe aortic regurgitation or severe primary mitral regurgitation or aortic stenosis with a peak transvalvular velocity >=3m/s or mitral stenosis with a mitral valve area < 1.5cm²
* Chronic atrial fibrillation or any significant arrhythmia at inclusion
* Renal insufficiency defined as eGFR<30 mL/min/1.73m²
* History of and candidate to bariatric surgery
* Obstructive hypertrophic cardiomyopathy (definition: maximal gradient at rest <30 mmHg)
* Hypertrophic cardiomyopathy due to a non-sarcomeric etiology, i.e. known infiltrative or storage disorder mimicking HCM such as Fabry disease or amyloidosis
* Life threatening comorbidities (i.e. history of or active cancer treated with chemo-therapy or radiotherapy, end-stage heart failure, severe lung disease, cirrhosis)
* Pregnancy
* Lactating mother.
* Any condition which in the Investigator*s opinion makes it undesirable for the subject to participate in the study or which would jeopardize compliance with the protocol (e.g. known contrast allergy)
* Inability to understand the local language
* Individuals deprived of liberty
* Protected persons (under guardianship or curatorship)
* Contra-indication to CMR (please see CMR_SOP)
* Known hypersensitivity to gandolinium based product (including gadoteric acid and meglumine)
* Known symptomatic COVID-19 infection requiring hospitalization.

Study design

Design

Study type:	Observational invasive
Intervention model:	Other
Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	07-07-2021
Enrollment:	100
Type:	Actual

Ethics review

Approved WMO Date:	18-05-2020
Application type:	First submission
Review commission:	METC academisch ziekenhuis Maastricht/Universiteit Maastricht, METC azM/UM (Maastricht)
Approved WMO Date:	26-09-2022
Application type:	Amendment
Review commission:	METC academisch ziekenhuis Maastricht/Universiteit Maastricht, METC azM/UM (Maastricht)
Approved WMO Date:	08-01-2024
Application type:	Amendment
Review commission:	METC academisch ziekenhuis Maastricht/Universiteit Maastricht, METC azM/UM (Maastricht)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
ClinicalTrials.gov	NCT04303364
CCMO	NL71063.068.19