Aging, chronic disease, mitoPO2 and mitoVO2

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Greater age will be associated with a lower mitoVO2 and mitoPO2. Comorbidities likewise will be associated with a lower mitoVO2 and mitoPO2

Ethical review	Positive opinion
Status	Recruiting
Health condition type	-
Study type	Observational non invasive

Summary

ID

NL-OMON25614

Source
NTR

Brief title
TBA

Health condition

Diabetes Mellitus type II, Obesity, and Neurodegenerative diseases

Sponsors and support

Primary sponsor: Erasmus Medical Center Rotterdam
Source(s) of monetary or material Support: N/A

Intervention

Outcome measures

Primary outcome

- To investigate the association between age and mitoPO2 values

Secondary outcome

- To investigate the association between age and mitoVO2 values. - To examine the association between diabetes, obesity and neurodegenerative disease and mitoPO2/mitoVO2 values. - To compare mitoPO2 and mitoVO2 measurements performed on the sternum as opposed to the mitoPO2 and mitoVO2 measurements performed on the upper arm

Study description

Background summary

A new technique to measure mitochondrial oxygen tension was recently developed and calibrated by our lab. With this technique, mitochondrial oxygen tension ‘mitoPO2’ and mitochondrial oxygen consumption ‘mitoVO2’ can be measured in human skin. This led to the introduction of the COMET, an acronym of Cellular Oxygen METabolism (COMET, Photonics Healthcare B.V. Utrecht) which enables bed-side monitoring of mitoPO2 and mitoVO2 in real time. Previous studies have illustrated the potential of these measurements in various clinical conditions, unfortunately the influence of aging and chronic disease has not been examined. Before the COMET monitor can be used in clinical settings, it has to be known if these factors have any influence on the measurements. This study will therefore, examine the association between age and mitoPO2 and mitoVO2 values. Secondly, it will investigate whether there is any association between comorbidity and mitoPO2.mitoVO2. Lastly, the study will evaluate ifmitoPO2 and mitoVO2 values differ between measurement location namely, the upper arm or sternum. This is because measurement locations vary in different clinical settings.

Study objective

Greater age will be associated with a lower mitoVO2 and mitoPO2. Comorbidities likewise will be associated with a lower mitoVO2 and mitoPO2

Study design

Measurement day

Contacts

Public
Erasmus Medical Center Rotterdam
Calvin de Wijs

00310683598940

Scientific
Erasmus Medical Center Rotterdam
Calvin de Wijs

00310683598940

Eligibility criteria

Inclusion criteria

Healthy Volunteers - Aged ≥ 18 and ≤ 90 years old - Acceptable proficiency of the Dutch language - Healthy volunteers without physical or mental illness Comorbidity group - Aged ≥ 18 and ≤ 90 years old - Acceptable proficiency of the Dutch language - One of the underlying illnesses: neurodegenerative disease, diabetes mellitus type II or obesity (BMI>30), no other relevant comorbidity

Exclusion criteria

- Porphyria - Known intolerance to components of the ALA plaster - Presence of mitochondrial disease - Pregnancy/lactation - Patients with skin lesions on the measurement location which impede measurements - Incapability to provide inform consent, due to a mental condition interfering with the ability to understand the provided information

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non controlled trial
Masking:	Open (masking not used)
Control:	N/A , unknown

Recruitment

NL
Recruitment status: Recruiting

Start date (anticipated):	01-05-2021
Enrollment:	319
Type:	Anticipated

IPD sharing statement

Plan to share IPD: Undecided

Ethics review

Positive opinion

Date:	16-08-2021
Application type:	First submission

Study registrations

Followed up by the following (possibly more current) registration

ID: 51166
Bron: ToetsingOnline
Titel:

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

No registrations found.

In other registers

Register	ID
NTR-new	NL9670
CCMO	NL76685.078.21
OMON	NL-OMON51166

Study results