Carotid body dysfunction in type 2 diabetes

No registrations found.

Ethical review	Positive opinion
Status	Recruiting
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON21994

Source
NTR

Brief title
CBHYPOXIA

Health condition

Diabetes Mellitus

Sponsors and support

Primary sponsor: LUMC
Source(s) of monetary or material Support: Smartqare

Intervention

Outcome measures

Primary outcome

The main study parameter is the change in the slope of the hypoxic ventilatory response curve from baseline to euglycemic hyperinsulinemia in patients with type 2 diabetes compared to healthy controls.

Secondary outcome

Secondary parameters are differences between the two groups in heart rate variability in baseline and during hypoxia

Study description

Background summary

During the COVID-19 pandemic patients with comorbidities such as hypertension, diabetes mellitus, obesity and pregnancy were overrepresented in the population that was admitted to the hospital. Morbidity and mortality due to SARS-COV-2 infection was higher in these patients compared to patients without these comorbidities. The higher incidence, morbidity and mortality is suggestive of an underlying mechanism that puts these patients more at risk. A proposed mechanism is the sympathetic overactivity that is associated with these conditions. Recently, it has become clear that the carotid bodies play an important role in sympathetic overactivity in these conditions. Dysfunction of this organ is associated with decreased chemosensitivity, disruption of insulin sensitivity, but is also associated with changes in neurohumoral control in response to infection. Whether carotid body dysfunction can explain the severity of SARS-COV-2 infection remains to be seen. The aim of this study is to find whether patients with type 2 diabetes have altered chemosensitivity and are in fact sympathetically overactive compared to healthy controls and during a hyperinsulinemic euglycemic clamp. Findings could help explain why type 2 diabetes patients are more heavily affected by SARS-COV-2 and could identify potential targets for treatment in these patients.

Study objective

Type 2 diabetes have altered chemosensitivity and are in fact sympathetically overactive compared to healthy controls during a hyperinsulinemic euglycemic clamp.

Study design

Screening, one visit

Intervention

Euglycemic hyperinsulinemic clamp; hypoxic ventilalatory response

Contacts

Public
LUMC
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Scientific
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Eligibility criteria

Inclusion criteria

• 18 years and older
• Subjects must be willing to give written informed consent for the trial and able to adhere to dose and visit schedule.
• Non-insulin-dependent diabetes mellitus (NIDDM) or healthy sex, age (± 3 yrs) and BMI (± 3 kg/m2) matched controls.
• Have no clinical or electrocardiographic signs of ischemic heart disease as determined by the Investigator with normal cardiac intervals appropriate for their gender. The Screening 12 lead ECG conduction intervals must be within gender specific normal range (e.g., QTcF ≤ 430 msec, PR interval ≤ 220 msec). ECGs are to be judged by the investigator or sub investigator as per standardized procedures.
• Vital sign measurements must be within the following ranges: (Individuals with values outside (or indicate lower or higher) of these ranges may be enrolled if clinically acceptable to the investigator and sponsor.
o body temperature, between 35.5°C and 37.5°C
o systolic blood pressure, 90 to 150 mmHg
o diastolic blood pressure, 40 to 95 mmHg
o pulse rate, 40 to 100 bpm
• Subjects must be free of any clinically significant disease that would interfere with the study evaluations.
• Subjects presenting out of range values of lab/ECG/vital signs compatible with normal variation of the normal healthy subject can be included in the study at the investigator’s discretion and sponsor written approval.
• Positive Allen’s test
• Fitzpatrick skin type I or II

Exclusion criteria

• Insulin dependent diabetes mellitus
• Diagnosed Obstructive Sleep Apnea (OSAS) or high suspicion of OSAS determined by a STOP-BANG score > 5
• Respiratory or cardiovascular disease

• Smoking/vaping
• Positive pregnancy test
• conditions that result in elevated levels of methaemoglobinia
• body mass index > 35 kg/m2
• Use of illicit drugs
• Use of prescription opioids or benzodiazepines
• Failure of the drug of abuse tests at screening or check-in.
• History of dyspnea, asthma, tuberculosis, chronic obstructive pulmonary disease, or any other ventilatory / lung disease.
• Subjects with excessive facial hair preventing sealing of the occlusive face mask.
• Subjects who, in the opinion of the investigator, will not be able to participate optimally in the study.
• Subject who has a history of any infectious disease within 4 weeks prior to drug administration that in the opinion of the investigator, affects the subject's ability to participate in the trial.
• Subjects who are part of the study staff personnel or family members of the study staff personnel.
• Subjects who have demonstrated allergic reactions (e.g., food, drug, atopic reactions or asthmatic episodes) which, in the opinion of the investigator and sponsor, interfere with their ability to participate in the trial.
• Personal or family history of arrhythmias or ECG conductance abnormalities.
• Hypokalemia defined as <3.5 mmol/L

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Non controlled trial
Masking:	Single blinded (masking used)
Control:	Active

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	05-10-2021
Enrollment:	30
Type:	Anticipated

IPD sharing statement

Plan to share IPD: Undecided

Plan description
yet to be determined

Ethics review

Positive opinion
Date: 05-10-2021
Application type: First submission

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
NTR-new	NL9769
Other	METC Leiden-Den Haag-Delft. (METC-LDD) : P21-082

Study results

Summary results
n/a