Microbiota inhabiting the small intestine in relation to glycaemic and inflammatory status of morbidly obese subjects.

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To determine if the microbiota inhabiting the small intestine in morbidly obese patients with T2DM is comparable to those without T2DM and, if not, what are the deviations and what is their impact

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Glucose metabolism disorders (incl diabetes mellitus)
Study type	Observational invasive

Summary

ID

NL-OMON38923

Source
ToetsingOnline

Brief title
Microbiota inhabiting the small intestine in relation to diabetes

Condition

- Glucose metabolism disorders (incl diabetes mellitus)
- Appetite and general nutritional disorders
- Gastrointestinal therapeutic procedures

Synonym
diabetes mellitus, obesity

Research involving
Human

Sponsors and support

Primary sponsor: Sint Antonius Ziekenhuis
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: diabetes, microbiota, obesity, small intestine

Outcome measures

Primary outcome

Microbiota composition:

- adherent microbiota at site of ileum

- luminary small intestinal microbiota composition

- faecal microbiota composition

Insulin resistance (plasma):

- Glucose

- Insulin

- HbA1C

Inflammation:

- CRP (plasma)

- histological staining

Secondary outcome

- BMI

- Diet

Study description

Background summary

Obesity and type 2 diabetes (T2DM) are characterized by altered gut microbiota composition and systemic inflammation. These have in turn been associated with gut barrier disruption.
Specific bacteria such as the Akkermansia muciniphila reside in the mucus layer of the intestinal wall and degrade mucin. Akkermansia muciniphila has been found to correlates inversely with body weight and increase intestinal barrier function in mice studies (9). Moreover, in human T2DM we found the mucus composition to be altered, and adherent bacteria at the site of the small intestine to induce a systemic inflammatory reaction. Altogether, these studies plead for a role of gut bacteria and impaired barrier function in obesity-induced T2DM. Up until now, microbiota studies are all based on faecal analysis, which mainly reflects the colonic microbiota composition. The large intestine contains around one kilogram of mainly bacteria, and the colonic wall is relatively thick and well-protected against potential bacterial infiltration. In contrast, the small intestinal wall is relatively thin and less well protected against bacterial infiltration. Marked differences exist between the bacterial numbers, composition and activity of the small and large intestine.
In the context of T2DM, several studies emphasize the pivotal role of the small intestine. First, exclusion of the first part of the small intestine results in almost immediate improvement of T2DM. More convincing evidence for the role of the small intestine in development of T2DM is provided by the success of newest incretin-based medical therapy for T2DM, which are based upon gut hormones secreted through receptor signalling in the small intestine. In addition, small intestinal bacterial overgrowth (SIBO) has been associated with human T2DM. Current therapeutic studies even focus on improving diabetes by influencing microbiota composition.

Study objective

To determine if the microbiota inhabiting the small intestine in morbidly obese patients with T2DM is comparable to those without T2DM and, if not, what are the deviations and what is their impact

Study design

In this observational cross-sectional study, we intend to include 50 subjects and investigate their small intestinal and colonic flora in relation to their glycaemic and inflammatory status.

Study burden and risks

Patients are asked to collect faeces in a faecal collector for one day preoperative. also, they are asked to register their diet in a diary for one week.
During surgery, a small biopsy will be taken from the intestinal wall, a procedure which showed nog adverse events in a previous study.
Blood samples will be taken regarding the current protocol, providing the necessary amount of blood for the determination of CRP, HbA1c, insulin and glucose. Patients do not have to visit the hospital more frequent then patients who do not participate in this study. In addition, hospitalization time will not be extended because of this study.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

- BMI> 40 or BMI> 35 kg/m2 with or without co-morbidities
- undergoing hastric bypass surgery
- Age 18-60 years (in line with the indication criteria for bariatric surgery)
- Caucasian race (previous research showed that people of different ethnicity vary in intestinal microbiota composition)

Exclusion criteria

- Age <18 or> 60 years
- Alcohol abuse (>10 standard international units/week) or any drug use (Cannabis, cocaine, etc)
- Auto-immune and / or inflammatory diseases (eg sarcoidosis, diabetes mellitus type I, liver disease, or intestinal diseases such as inflammatory bowel disease)
- Antibiotics usage <6mnd prior to inclusion (because of their effect on the intestinal microbiota)

Study design

Design

Study type: Observational invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	06-03-2015
Enrollment:	50
Type:	Actual

Ethics review

Approved WMO

Date:	12-12-2013
Application type:	First submission
Review commission:	MEC-U: Medical Research Ethics Committees United (Nieuwegein)

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
CCMO	NL46559.100.13