Beneficial effects of caloric and protein restriction on markers of the stress response and postoperative recovery

Published: 31-07-2012
Last updated: 19-03-2025

To investigate the feasibility and safety of a diet containing 30% caloric and 70% protein restriction given during five days in healthy kidney donors planned to undergo a live kidney donation as well as persons awaiting bariatric surgery....

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON41323

Source
ToetsingOnline

Brief title
PROTECT - the Protein and Caloric restriction Trial

Condition

- Other condition
- Appetite and general nutritional disorders
- Gastrointestinal therapeutic procedures

Synonym
bariatric surgery, healthy kidney donors

Health condition

nierdonatie bij leven

Research involving

Human

Sponsors and support

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

Intervention

Keyword: Bariatric surgery, Dietary restriction, Live kidney donation, Oxidative stress

Outcome measures

Primary outcome

- Primary outcome measure in phase 1 is the objective feasibility measured as the percentage of patients completing the diet, reasons for not adhering to the diet (if applicable) and the levels of metabolic parameters.

- Primary parameter in phase 1c is the effect of morbid obesity on different ages on telomere length in leukocytes.

- Primary parameter in phase 1d/ phase 1e (validation of telomere length measurement and measurement telomerase activity) is the effect of morbid obesity, the metabole syndrome and bariatric surgery on telomere length and telomerase activity in leukocytes.

- Main study parameters in phase 2 are markers of the adaptive stress response at mRNA and protein level measured in tissue biopsies obtained perioperatively.

Secondary outcome

- Phase 1: subjective feasibility of a diet containing caloric and protein restriction.

- Phase 1d/ phase 1e (measurement of telomere length): the role of bariatric surgery on the telomere attrition induced by morbid obesity via measurement of

telomere lengths before and at timepoints 3, 6, 12 and 24 months after

bariatric surgery.

- Phase 2: the effects of a diet consisting of caloric and protein restriction

on the subjective postoperative recovery, the acute phase response and

metabolic parameters.

Study description

Background summary

Animal studies over the past years have shown that caloric restriction (CR), the reduction of the amount of calories in our diet without causing malnutrition, has many positive effects like the extension of the lifespan. This response is collectively called the adaptive stress response. The precise etiology underlying this response is still unknown. One of the factors playing an important role is the better resistance against oxidative stress. Recently discovered is the role of protein restriction in this process. Previously to this research, a clinical study is performed in live healthy kidney donors given a diet of 3 days of 30% caloric restriction and 24 hours of fasting. This study showed the feasibility of such a diet in patients. With the present study, we first like to investigate the safety and feasibility of a caloric and protein restricted diet in a clinical setting. In the second phase we aim to study the mRNA and protein levels of markers of the adaptive stress response at a tissue level as well as the postoperative recovery.

Study objective

To investigate the feasibility and safety of a diet containing 30% caloric and 70% protein restriction given during five days in healthy kidney donors planned to undergo a live kidney donation as well as persons awaiting bariatric surgery. Subsequently, the effects of the diet on the mRNA and protein expression levels of markers of the adaptive stress response will be determined. This is done in patients undergoing live kidney donation or bariatric surgery. In addition, the postoperative subjective recovery and the perioperative cytokine response after a caloric and protein restricted diet will be measured.

Study design

A randomised controlled study, divided into two phases. Phase 1 is a pilot

study and investigates the feasibility and safety of a diet containing caloric and protein restriction. The diet is given while patients are awaiting surgery. Phase 2 investigates the effects of the diet when given before surgery on markers of the stress response, the acute phase response and postoperative recovery. Pre- and postoperatively, several extra blood samples are taken. In phase 2, at the beginning of the surgery biopsies of the liver, the muscle (musculus rectus abdominis) and the abdominal fat (visceral and subcutaneous fat) are taken. In phase 2a, biopsies of the kidney will be taken in the live kidney donors at three different time points during surgery. Pre- and postoperatively, patients are asked to fill in questionnaires about their quality of life, pain scores, nausea and fatigue.

Intervention

The nutritional interventional consists of a synthetic diet consisting of 30% caloric and 70% protein restriction, calculated by means of the daily energy requirements via de Harris-Benedict formula. Groups receiving a synthetic diet isocaloric to a normal diet or a normal diet measured via a dietary diary are used as controls. In phase 1, the diet will be given while the patients are awaiting surgery without inclusion of the surgery. In phase 2, the diet will be given preoperatively. In phase 2, no more patients will be randomized in the group receiving the synthetic isocaloric diet.

Study burden and risks

- In the intervention group, feelings of hunger and light-headedness may occur during the diet.
- The control group without intervention is asked to keep up a dietary diary.
- Several questionnaires are asked to be filled in pre- and postoperatively.
- Biopsies of liver, muscle and fat are taken perioperatively (only in phase 2).
- In phase 2a, in live kidney donors biopsies of the kidney will be taken perioperatively at three different time points.
- Several extra blood samples are taken pre- and postoperatively.
- Phase 1c (measurement of telomere length): one extra blood sample is taken during the outpatient clinic.
- Phase 1d/ phase 1e (validation of measurement of telomere length and measurement telomerase activity): five times two extra blood samples taken before and after bariatric surgery during visits at the outpatient clinic.

Contacts

Public
RIVM

Antonie van Leeuwenhoeklaan 9
Bilthoven 3721 MA
NL
Scientific
RIVM

Antonie van Leeuwenhoeklaan 9
Bilthoven 3721 MA
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

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

Inclusion criteria

- scheduled for (phase 1a) or undergoing (phase 2a) laparoscopic live kidney nephrectomy
- scheduled for (phase 1b, phase 1c, phase 1d, phase 1e) and/or undergoing (phase 2b, phase 1d, phase 1e) laparoscopic bariatric surgery

Exclusion criteria

Phase 1a (awaiting live kidney donation):
- Allergic to any of the ingredients of the diet
- Participation in another clinical trial within the last 30 days
Phase 1b (awaiting bariatric surgery):
- Allergic to any of the ingredients of the diet
- Participation in another clinical trial within the last 30 days
- BMI < 40
- Co-morbidities as in diabetes mellitus
- Morbid obesity caused by genetic defects or syndromes
Phase 1c (telomere length measurement):
- BMI < 40

- Co-morbidities as in diabetes mellitus
- Morbid obesity caused by genetic defects/syndromes
Phase 1d/Phase 1e (validation of telomere lenght measurement and measurement telomerase activity):
- BMI < 35
- Morbid obesity caused by genetic defects/syndromes
Phase 2a (undergoing live kidney donation):
- Allergic to any of the ingredients of the diet
- Bilateral abnormalities of the renal arteries (origin stenosis)
- Previous operations of the kidney(s) or adrenals gland(s)
- Radiological abnormalities necessitating an open approach
- Perioperative conversion to an open approach
- Participation in another clinical trial within the last 30 days
- Usage of therapeutic anti-clotting medication
Phase 2b (undergoing bariatric surgery):
- Allergic to any of the ingredients of the diet
- Previous operations of the stomach or duodenum
- Any abnormalities necessitating an open approach
- Perioperative conversion to an open approach
- Participation in another clinical trial within the last 30 days
- Liver abnormalities found perioperatively necessitating postponing of surgery
- Preoperative risk assessment necessitating nutritional intervention
- BMI < 40
- Co-morbidity as in diabetes mellitus
- Morbid obesity caused by genetic defects or syndromes
- Usage of therapeutic anti-clotting medication

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	18-02-2013
Enrollment:	315
Type:	Actual

Ethics review

Approved WMO Date:	31-07-2012
Application type:	First submission
Review commission:	METC Erasmus MC, Universitair Medisch Centrum Rotterdam (Rotterdam)
Approved WMO Date:	25-04-2013
Application type:	Amendment
Review commission:	METC Erasmus MC, Universitair Medisch Centrum Rotterdam (Rotterdam)
Approved WMO Date:	28-05-2013
Application type:	Amendment
Review commission:	METC Erasmus MC, Universitair Medisch Centrum Rotterdam (Rotterdam)
Approved WMO Date:	09-12-2013
Application type:	Amendment
Review commission:	METC Erasmus MC, Universitair Medisch Centrum Rotterdam (Rotterdam)
Approved WMO Date:	13-03-2014
Application type:	Amendment
Review commission:	METC Erasmus MC, Universitair Medisch Centrum Rotterdam (Rotterdam)
Approved WMO Date:	11-07-2014
Application type:	Amendment
Review commission:	METC Erasmus MC, Universitair Medisch Centrum Rotterdam (Rotterdam)

Approved WMO Date:	06-11-2014
Application type:	Amendment
Review commission:	METC Erasmus MC, Universitair Medisch Centrum Rotterdam (Rotterdam)
Approved WMO Date:	16-03-2015
Application type:	Amendment
Review commission:	METC Erasmus MC, Universitair Medisch Centrum Rotterdam (Rotterdam)
Approved WMO Date:	10-08-2015
Application type:	Amendment
Review commission:	METC Erasmus MC, Universitair Medisch Centrum Rotterdam (Rotterdam)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

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

ID: 28311
Source: Nationaal Trial Register
Title:

In other registers

Register	ID
CCMO	NL39461.078.12
OMON	NL-OMON28311