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Design and validation of a fasting mimicking diet

Submission date	Recruitment status	[X] Prospectively registered
03/05/2017	No longer recruiting	[_] Protocol
Registration date	**Overall study status**	[_] Statistical analysis plan
17/05/2017	Completed	[X] Results
Last Edited	**Condition category**	[_] Individual participant data
26/05/2020	Signs and Symptoms	

Plain English summary of protocol

Background and study aims
Critical illness is a state in which patients depend on drugs or machines to support or replace organ function to keep them alive and allow them to heal. Such patients are admitted to intensive care units (ICU) to receive care. Critically ill patients are at risk of losing muscle power due to due to the natural breakdown of tissue from inactivity. Short term fasting may be beneficial in the recovery of disease. Even in ICU, withholding intravenous nutrition (nutrition delivered through a drip) for one week, surprisingly, avoids complications and allows severely ill patients to recover faster and go home earlier. This study is aiming to see if these beneficial effects can be broadened beyond the first week of critical illness. The aim of this study is to design a new fasting mimicking diet in ICU (ICU-FM) based on cyclic feeding interruptions and look at its effects.

Who can participate?
Adult patients in ICU who are unable to eat by mouth.

What does the study involve?
Participants are randomly allocated to undergo 12 hours of receiving nutrition through a drip or straight into the gut followed by 12 hours of fasting, or 12 hours of fasting followed by 12 hours of receiving nutrition through a drip or straight into the gut. If the 12 hour time period is judged to be insufficient, then the process is repeated using 24 hour time periods. At the start of the study and then after 12 or 24 hours (depending on the time period used), participants have samples of blood collected to assess their health. In addition, participants have their medical records reviewed after 7 and 90 days to assess survival rates.

What are the possible benefits and risks of participating?
There are no direct benefits or risks involved with participating.

Where is the study run from?
UZ Leuven (Belgium)

When is the study starting and how long is it expected to run for?
June 2016 to October 2017

Who is funding the study?
1. KU Leuven (Belgium)
2. Flanders Government FWO (Belgium)

Who is the main contact?
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Contact information

Type(s)
Scientific

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Additional identifiers

Protocol serial number
ICU-FM-I-2016-1-1-2

Study information

Scientific Title
ICU-FM: Implementation into the intensive care unit (ICU) of the beneficial effects of fasting (mimicking diets) (FM)

Acronym
ICU-FM-I

Study objectives
Twelve hours of nutrient restriction are sufficient to provoke a metabolic fasting response in critically ill patients, as reflected by increased plasma bilirubin and decreased insulin requirements.

Ethics approval required

Old ethics approval format

Ethics approval(s)
Commissie Medische Ethiek UZ KU Leuven , 27/07/2016, ref: B322201629914

Study design
Pilot randomised cross-over study

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Prolonged critical illness

Interventions
Participants are randomised by central computer in permuted blocks (size unknown to all involved) in a 1:1 ratio to either the 12/12 (or 24/24 if 12 hours would be not sufficient) caloric restriction (CR) regime followed by feeding or feeding followed by CR. All outcome assessors will be blinded for treatment allocation.

Nutritional targets will be achieved by EN±PN, as appropriate with a full feeding target of 20-25 kcal/kg ideal body weight, a dosage defined by age (< or > 60 years) and gender. During fasting intervals, no nutrition will be administered, unless spontaneous hypoglycemia occurs. The intervention is thus to infuse enteral and/or parenteral nutrition as required to achieve nutritional target during a 12 hours (or in faze 2: 24 hours) interval on ICU day 8. This is followed by a 12 hours or 24 hours fasting. The sequence of this metabolic cross over experiment is determined by randomization.

Plasma bilirubin, creatinine, BUN and glucose values and insulin requirements will be collected at study start, after the fasting window and after full feeding. Blood samples for evaluation of other changes in metabolism and cellular biology will be drawn likewise before and after the feeding and fasting interval.

Intervention Type
Other

Primary outcome(s)
1. Plasma bilirubin is measured by colorimetric assay in the Laboratory of Intensive Care Medicine at baseline and after the first and second intervention time window (12 hours or 24 hours according to the study phase)
2. Insulin requirements (total dose delivered over intervention time interval, this is the last 12 hours or 24 hours according to the study phase) are measured by reviewing the ICU-PDMS (Patient Data Management System [Metavision]) at baseline and after the first and the second intervention time window (this is after 12 hours and 24 hours in the first phase and eventually after 24 hours and 48 hours in the second phase of the study)

Key secondary outcome(s))

1. Mortality is measured using data from the National Registry via Hospital Clinical Work Station (KWS) at 90 days
2. New ICU-Morbidity occurring in the first week after randomization is assessed by reviewing the ICU-PDMS (Patient Data Management System [Metavision]) at baseline and 7 days

Completion date
01/10/2017

Eligibility

Key inclusion criteria
1. Adult ICU-patients
2. Unable to eat by mouth
3. Expected on day 7 to stay 3 more days in ICU

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Total final enrolment
70

Key exclusion criteria
1. Patients with severe jaundice
2. Bilirubin > 5mg/dL, pregnant
3. Lactating patients

Date of first enrolment
01/06/2017

Date of final enrolment
01/10/2017

Locations

Countries of recruitment
Belgium

Study participating centre

UZ Leuven
Clincial Department of Intensive Care Medicine
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Sponsor information

Organisation
UZ Leuven

ROR
https://ror.org/0424bsv16

Funder(s)

Funder type
Research organisation

Funder Name
KU Leuven

Alternative Name(s)
Katholieke Universiteit Leuven

Funding Body Type
Private sector organisation

Funding Body Subtype
Universities (academic only)

Location
Belgium

Funder Name
Flanders Government FWO

Results and Publications

Individual participant data (IPD) sharing plan

The participant level data of this step I pilot metabolic cross over clinical experiment will not be publicly available. This would be a potential source of erroneous findings due to inadequate interpretation of the study design. The data will be stored in the research database of the Clinical Department and Laboratory of Intensive Care Medicine and request for post-hoc analyses with a clearly defined research question and methodology can be sent to the investigators. This approach to avoid misinterpretation of complex data and databases has been proposed in a recent summit on data-sharing organized by the NEJM in April 2017.

IPD sharing plan summary

Not expected to be made available

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	24/05/2020	26/05/2020	Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes
Study website	Study website	11/11/2025	11/11/2025	No	Yes