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Impact of Early Parenteral Nutrition completing enteral nutrition In adult Critically ill patients

Submission date 13/03/2007	**Recruitment status** No longer recruiting	[X] Prospectively registered [X] Protocol [_] Statistical analysis plan [X] Results [_] Individual participant data
Registration date 28/03/2007	**Overall study status** Completed	
Last Edited 07/03/2019	**Condition category** Signs and Symptoms	

Plain English summary of protocol
Not provided at time of registration

Contact information

Type(s)
Scientific

Contact name
Prof Greet Van den Berghe

Contact details
Director of the Department of Intensive Care Medicine
Catholic University Leuven University Hospitals, and
Chair of the Division of Acute Medical Sciences
Catholic University Leuven
Herestraat 49
Leuven
Belgium
3000

Additional identifiers

EudraCT/CTIS number
2007-000169-40

IRAS number

ClinicalTrials.gov number
NCT00512122

Secondary identifying numbers

EPaNIC 2007.1-2-2; Clinical study no.: S50404

Study information

Scientific Title
Impact of Early Parenteral Nutrition completing enteral nutrition In adult Critically ill patients

Acronym
EPaNIC

Study objectives
In critically ill patients, a strategy aimed at an early delivery of full caloric support, with a combination of Enteral Nutrition (EN) and Parenteral Nutrition (PN) (in conditions preventing hyperglycemia and overfeeding), results in shorter Intensive Care Unit (ICU) and hospital stay and less morbidity as compared to a strategy using only EN.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Institutional Review Board of the Catholic University Leuven School of Medicine, 21/03/2007, ref: ML4190

Added 25/05/2010:
All amendments were approved by the Institutional Review Board of the Catholic University of Leuven School of Medicine. Latest approval date was 15/03/2010, ref: ML4190
The addition of a new study site and conversion to multicentre trial was authorised by the Belgian Federal Agency for Medicine and Health Products on 12/01/2010

Study design
Open-label prospective randomised controlled parallel-group trial

Primary study design
Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
Hospital

Study type(s)
Treatment

Participant information sheet

Health condition(s) or problem(s) studied
Critical Illness

Interventions

Written informed consent will be obtained from the patient or the closest family member or legal guardian. The family member or the patient can withdraw from the trial, at any time, without impact on his treatment or penalty. The investigators confirm that this study concerns a condition that directly threatens patient health and that the adult patient not able to give consent suffers from the condition. The experiment is essential to confirm the results from earlier research in patients who could consent or from other research methods.

On admission patients will be randomly assigned to receive EN combined with early PN or only EN. At ICU admission, consecutive patients will be randomly assigned to one of these two treatment groups using blinded envelopes, stratified according to primary diagnostic category on admission.
Paragraph amended 25/05/2010: Upon addition of the new study site, the numbered en sealed envelopes for randomization stratified according to primary diagnostic category on admission were replaced by an identical digital system allowing central randomisation

As initial nutritional support, patients randomised to the EN combined with early PN group will receive glucose 20% at 40 ml/hr. EN will be initiated in the evening of the second ICU hospitalisation day, PN will be started the morning of the third ICU hospitalisation day. The amount of PN to be given on any particular day will be the difference between calculated caloric needs and the calories delivered by EN the previous 24 hours. When EN covers 80% of calculated caloric needs PN will be stopped. When the patient is able to eat, the parenteral regimen will be reduced and eventually stopped. Whenever oral (+ enteral) intake is below 50% of calculated caloric needs, the PN will be (re)-started.

As initial nutritional support, patients randomised to the EN only group will receive glucose 5% at 40 ml/hr. EN will be initiated on the evening of the second ICU day. From the morning of the third ICU hospitalisation day on, the amount of glucose 5% to be given will be the same as the volume of PN the patient theoretically would require to receive 100% of presumed caloric needs based on the amount of EN delivered the previous 24 hours. When the patient is able to eat, the parenteral regimen (glucose 5%) will be reduced to 50% and eventually stopped. Whenever oral (+ enteral) intake is below 50% of calculated caloric needs, the PN (glucose 5%) will be (re)-started. If these patients would need to stay for more than seven days on the ICU and enteral feeding of at least 80% of the calculated calories is not possible, they will be switched to EN and PN on day eight.

Common strategy for attempting early enteral nutrition in both study arms:
EN will be initiated on the evening of the second ICU day, unless patients are able to eat. The increase of enteral feeding volume and the adaptation of the regimen to pathological conditions will be according to protocol. Trace elements, minerals and vitamins will be administered daily intravenously (IV) to all patients from the day of admission onwards. IV substitution will be stopped in patients receiving at least 1500 ml of EN. All patients will be treated following the intensive insulin therapy schedule targeting a blood glucose level of 80 - 110 mg/dl from admission until discharge or oral feeding.

Patients will be weaned from the ventilator according to a standard protocol. End-of-care decisions in patients for whom further intensive care is considered to be futile will be taken in consensus by a group of two senior ICU physicians and the referring specialist, all blinded to study treatment allocation.

Added 25/05/2010:
In a subgroup of patients, pathways of inflammation and metabolism and the endocrinological impact of the intervention will be studied in blood samples and in snap-frozen in vivo biopsies of

muscle and adipose tissue. Blood and tissue samples from healthy volunteers will serve as references for these exploratory studies. In some patients, radiological evolution of regional muscle and adipose tissue volumes will be evaluated.

Intervention Type
Other

Phase
Not Specified

Primary outcome measure
Length of stay in ICU and the hospital

Secondary outcome measures
Current information as of 25/05/2010:
1. Death (hospital, ICU and 90 days mortality)
2. The secondary morbidity outcomes will include:
2.1. Days to weaning from mechanical ventilation
2.2. The need for renal replacement therapies
2.3. The presence or absence of new kidney injury during intensive care
2.4. Days of vasopressor or inotropic support
2.5. The presence or absence of signs of ICU liver disease: hyperbilirubinemia (defined as bilirubin level > 3 mg/dl), presence of liversteatosis, sludge
2.6. The need for tracheotomy
2.7. The presence or absence of hyper-inflammation within five days after ICU admission
2.8. Blood lipid profiles and albumin on days one, five, ten, and 15 after admission
2.9. The presence or absence of bacteraemia, ventilator-associated pneumonia and of wound infections
2.10. Episodes of hypoglycaemic events (defined as glycemia less than 40 mg/dl)
2.11. Amount and type of calories delivered
2.12. Muscle strength and rehabilitation
2.13. Presence of clinical and electrophysiological signs of respiratory and peripheral muscle weakness

Initial information at time of registration:
1. Death (hospital and ICU mortality)
2. The secondary morbidity outcomes will include:
2.1. Days to weaning from mechanical ventilation
2.2. The need for renal replacement therapies
2.3. The presence or absence of new kidney injury during intensive care
2.4. Days of vasopressor or inotropic support
2.5. The presence or absence of hyperbilirubinemia and liversteatosis
2.6. The need for tracheotomy
2.7. The presence or absence of hyper-inflammation within five days after ICU admission
2.8. Blood lipid profiles and albumin on days one, five, ten, and 15 after admission
2.9. The presence or absence of bacteraemia, ventilator-associated pneumonia and of wound infections
2.10. Episodes of hypoglycaemic events (defined as glycemia less than 40 mg/dl)
2.11. Amount and type of calories delivered
2.12. Muscle strength and rehabilitation

Overall study start date
01/05/2007

Completion date
08/02/2011

Eligibility

Key inclusion criteria
1. Patients admitted to any of the five intensive care units
2. Older than 18 years
3. Nutritional Risk Screening Score (NRS) score higher or equal to three upon ICU admission

Participant type(s)
Patient

Age group
Adult

Lower age limit
18 Years

Sex
Both

Target number of participants
4640 patients (2320 per arm)

Key exclusion criteria
1. Patients with a Do Not Resuscitate (DNR) code or moribund at the time of ICU admission
2. Patients already enrolled in another trial
3. Patients transferred from another intensive care unit with an established nutritional therapy
4. Patients suffering from ketoacidotic or hyperosmolar coma on admission
5. Patients with a Body Mass Index (BMI) below 17 kg/m^2
6. Short Bowel Syndrome
7. Patients known to be pregnant or nursing
8. Patients on mechanical ventilation at home
9. NRS score lower than three

Added 25/05/10:
10. Patient readmitted to ICU after randomisation to the EPaNIC trial
11. Patient not critically ill on admission (No clinical indication for central intravenous catheter or patient ready for oral nutrition on admission)

Date of first enrolment
01/08/2007

Date of final enrolment
08/11/2010

Locations

Countries of recruitment
Belgium

Study participating centre
Catholic University Leuven
Leuven
Belgium
3000

Sponsor information

Organisation
Catholic University Leuven (Katholieke Universiteit Leuven) (Belgium)

Sponsor details
c/o Professor Dr Ir Koenraad Debackere
Managing Director
Leuven Research and Development
Minderbroedersstraat 8A - bus 5105
Leuven
Belgium
3000

Sponsor type
University/education

Website
http://www.kuleuven.ac.be/english/index.htm

ROR
https://ror.org/05f950310

Funder(s)

Funder type
Industry

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
Fonds Wetenschappelijk Onderzoek

Alternative Name(s)
Research Foundation Flanders, Flemish Research Foundation, FWO

Funding Body Type
Government organisation

Funding Body Subtype
Local government

Location
Belgium

Funder Name
Baxter SAS (France) - unrestricted and non-conditional research grant

Results and Publications

Publication and dissemination plan
Not provided at time of registration

Intention to publish date

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not provided at time of registration

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article	protocol	24/01/2011		Yes	No
Other publications	post hoc analysis	01/02/2013	07/03/2019	Yes	No
Results article	cost-analysis results	25/05/2012	07/03/2019	Yes	No
Results article	preplanned subanalysis results	01/03/2013	07/03/2019	Yes	No
Results article	results	11/08/2011	07/03/2019	Yes	No
Results article	results	01/12/2015	07/03/2019	Yes	No
Results article	results	15/08/2014	07/03/2019	Yes	No
Results article	results	18/04/2013	07/03/2019	Yes	No
Results article	results	01/11/2017	07/03/2019	Yes	No
Results article	results	01/06/2017	07/03/2019	Yes	No
Results article	subanalysis results	01/10/2013	07/03/2019	Yes	No