# Re-feeding of children with severe acute malnutrition

Submission date	<b>Recruitment status</b> No longer recruiting	Prospectively registered	
24/08/2015		[] Protocol	
Registration date 02/09/2015	<b>Overall study status</b> Completed	[] Statistical analysis plan	
		[X] Results	
Last Edited 20/12/2019	<b>Condition category</b> Nutritional, Metabolic, Endocrine	Individual participant data	

# Plain English summary of protocol

Background and study aims

Severe acute malnutrition (SAM) is defined by the World Health Organisation (WHO) as a very low weight for height, an appearance of wasting away (wasting), or by the presence of nutritional oedema (swelling caused by a build-up of excess fluid in the body). When people are malnourished, the body's metabolism adapts to the lack of nutrients in order to survive, and levels of vitamins and minerals in the body go down. When starving people are re-fed, the body uses more of a mineral called phosphate, as this is needed for turning sugars in the diet into energy. If they are given diets with too much energy too soon then levels of phosphate in the body can become dangerously low as they are used up (re-feeding hypophosphataemia), which can be seriously damaging to health. Special diets have now been introduced which are fortified with phosphates in order to try to prevent re-feeding hypophosphataemia, but the effects of this have not been fully investigated. This study aims to monitor the amount of phosphorus in the blood plasma (P-phosphate) in children being treated for SAM during the re-feeding programme.

Who can participate?

Children admitted to Mwanamugimu Nutrition Unit (Uganda) with signs of SAM.

#### What does the study involve?

Children who are receiving treatment as an in-patient for SAM are given a therapeutic milk diet. The children are started on Formula 75 (F-75), which includes 75 calories per 100 ml. The F-75 therapeutic milk has been designed to meet the child's needs without overwhelming the body's systems at the start of treatment. The children are then moved onto Formula 100 (F-100) which contains 100 calories per 100 ml. The amount of P-phosphate is measured on admission, at the second day of treatment, at the start of the F-100 treatment, two days later and then at discharge.

What are the possible benefits and risks of participating?

The main benefit of participating in the study is the improved care provided. There are no risks of participating in the study.

Where is the study run from? Mwanamugimu Nutrition Unit (Uganda)

When is the study starting and how long is it expected to run for? October 2012 to May 2013

Who is funding the study?

- 1. University of Copenhagen (Denmark)
- 2. Augustinus Fonden (Denmark)
- 3. Lundbeckfonden (Denmark)
- 4. Brødrene Hartmanns Foundation (Denmark)
- 5. Arvid Nielsens Foundation (Denmark)
- 6. Axel Muusfeldts Foundation (Denmark)
- 7. Aase and Einar Danielsens Foundation (Denmark)
- 8. Torkild Steenbecks Scholarship (Denmark)

Who is the main contact? Professor Henrik Friis

# **Contact information**

**Type(s)** Scientific

**Contact name** Prof Henrik Friis

**ORCID ID** http://orcid.org/0000-0002-2848-2940

## **Contact details**

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# Additional identifiers

EudraCT/CTIS number

**IRAS number** 

ClinicalTrials.gov number

Secondary identifying numbers N/A

# Study information

Scientific Title

Re-feeding of children hospitalized with severe acute malnutrition: an observational study from Mwanamugimu Nutrition Unit, Uganda

#### Acronym

FeedSAM

#### Study objectives

The underlying study hypothesis is that children with severe acute malnutrition (SAM) have derangement of phosphorus and other electrolytes, and that these are not adequately corrected by current treatment, and hence delay or prevent recovery of nutritional status and essential body functions.

Primary objective: To assess changes in serum phosphate during treatment of children with SAM with therapeutic milk.

Secondary objectives: To assess changes in and/or predictors of anthropometry, clinical characteristics, child development and physical activity, blood essential fatty acids, immune factors, gut permeability and flora, heart function, and mortality.

#### Ethics approval required

Old ethics approval format

#### Ethics approval(s)

1. Research Ethics Committee Makerere University (Uganda), 08/08/2012, ref: 2012-134 2. The National Committee on Health and Research Ethics (Denmark), 20/08/2012, ref: 1208653

## Study design

Single-centre observational cohort study with nested cross-sectional study

# Primary study design

Observational

**Secondary study design** Cohort study

**Study setting(s)** Hospital

**Study type(s)** Treatment

#### Participant information sheet

Not available in web format, please use the contact details below to request a patient information sheet

# Health condition(s) or problem(s) studied

Severe acute malnutrition (SAM) in children

## Interventions

There was no experimental intervention. All study participants received in-patient treatment for complicated severe acute malnutrition according to standard protocols based on international guidelines. Uganda follows the approach stated in the Integrated Management for Acute

Malnutrition. The treatment is based on therapeutic milk diets (F-75 and F-100) to children hospitalized with SAM, and treating medical complications. A child is considered to have SAM if it has either weight for height (W/H) below the -3 standard deviations (SD) or mid upper arm circumference (MUAC) below the cut-off points for SAM or pitting oedema developing from both feet. In accordance with treatment guidelines, the duration of treatment with F-75 and F-100, and hence the follow-up time points, depended on the treatment response.

#### Intervention Type

Other

#### Primary outcome measure

Plasma phosphate was measured at five time points: on admission, the second day of treatment, the start of the transition to F-100, day two of transition and at discharge.

#### Secondary outcome measures

1.Blood essential fatty acids at admission, transition, discharge, 8 weeks, 16 weeks

2. Physical activity using accelerometers at discharge

3. Child development using the Malawi Development assessment tool at admission, transition, discharge, 8 weeks, 16 weeks

- 4. Thymus size using ultrasound at admission, discharge and week 8)
- 5. T-cell subsets and cytokines using flow cytometry at admission and discharge
- 6. Gut permeability (LM-test) at admission and discharge
- 7. Gut flora and pathogens at admission and discharge
- 8. Myocardial function and biomarkers at admission and discharge
- 9. Mortality during admission

#### Overall study start date

01/10/2012

## **Completion date**

01/05/2013

# Eligibility

## Key inclusion criteria

Children between 6 - 59 months of age
 Admitted to Mwanamugimu Nutrition Unit paediatric wards with either:
 Weight for height (W/H) below the -3 standard deviations (SD) and mid upper arm circumference (MUAC) below the cut-off points for SAM
 Pitting oedema developing from both feet
 Living near the study centre

Participant type(s)

Patient

**Age group** Child

**Lower age limit** 6 Months Upper age limit

59 Months

**Sex** Both

Target number of participants 120

**Total final enrolment** 120

Key exclusion criteria
1. Children with shock, severe respiratory difficulty or significant bleeding at the time of admission
2. Weight below 4.5 kg at admission
3. Very severe anaemia

Date of first enrolment 10/10/2012

Date of final enrolment 21/02/2013

# Locations

**Countries of recruitment** Uganda

**Study participating centre Mwanamugimu Nutrition Unit** Department of Paediatrics and Child Health Kampala Uganda

# Sponsor information

**Organisation** University of Copenhagen (Denmark)

**Sponsor details** Nørregade 10 Copenhagen Denmark 1165 +45 (0)35 32 26 26 ku@ku.dk

**Sponsor type** University/education

Website http://www.ku.dk/english/

ROR https://ror.org/035b05819

# Funder(s)

**Funder type** University/education

**Funder Name** Københavns Universitet

#### Alternative Name(s)

university\_of\_copenhagen, Københavns Universitet - University of Copenhagen, University of Copenhagen (UCPH), Copenhagen University, Københavns Universitet – Københavns Universitet, University of Copenhagen (KU), Denmark, Københavns Universitet – University of Copenaghen (UCPH), koebenhavns\_uni, Københavns Uni, University of Copenhagen, KU, UCPH

**Funding Body Type** Government organisation

**Funding Body Subtype** Universities (academic only)

**Location** Denmark

**Funder Name** Augustinus Fonden

Alternative Name(s) Augustinus Foundation

**Funding Body Type** Private sector organisation

#### Funding Body Subtype

Trusts, charities, foundations (both public and private)

**Location** Denmark

**Funder Name** Lundbeckfonden

Alternative Name(s) Lundbeckfonden

**Funding Body Type** Private sector organisation

**Funding Body Subtype** Other non-profit organizations

**Location** Denmark

**Funder Name** Brødrene Hartmanns Foundation

**Funder Name** Arvid Nielsens Foundation

**Funder Name** Axel Muusfeldts Foundation

**Funder Name** Aase and Einar Danielsens Foundation

**Funder Name** Torkild Steenbecks Scholarship

# **Results and Publications**

## Publication and dissemination plan

1. Changes in plasma phosphate during in-patient treatment of children with severe acute malnutrition: an observational study . Namusoke H, Hother AL, Rytter MJH, Kæstel P, Babirekere-Iriso E, Fabiansen C, Girma T, Ritz C, Michaelsen KF, Briend A, Friis H. Tentative publication date: November 1, 2015

2. Essential fatty acid composition and correlates in children with severe acute malnutrition. Babirekere-Iriso E, Lauritzen L, Mortensen CG, Rytter MJH, Mupere E, Namusoke H, Michaelsen KF, Briend A, Stark KD, Metherel AH, Friis H. Tentative publication date: January 1, 2016 3. Gut microbiota in children hospitalized with oedematous and non-oedematous severe acute

malnutrition in Uganda. Kristensen KHS; Wiese M; Rytter MJH; Özcam M; Hansen LH; Namusoke H; Friis H; Nielsen DS . Tentative publication date: February 1, 2016

Correlates of thymus size and changes during treatment of children with severe acute malnutrition: a cohort study. Tentative publication date: March 1, 2016

4. Risk factors for death in children during in-hospital treatment for severe acute malnutrition. Tentative publication date: April 1, 2016

5. Gut pathogens and their clinical correlates in children with severe acute malnutrition. Tentative publication date: April 1, 2016

6. Physical activity status at discharge among children admitted with severe acute malnutrition. Tentative publication date: April 1, 2016

7. Lymphocyte subsets in children with oedematous and non-oedematous severe acute malnutrition. Tentative publication date: October 1, 2016

8. Cytokine patterns and skin symptoms in children with severe acute malnutrition. Tentative publication date: October 1, 2016

9. Heart function in children with severe acute malnutrition. Tentative publication date: October 1, 2016

## Intention to publish date

01/11/2015

## Individual participant data (IPD) sharing plan

## IPD sharing plan summary

Not expected to be made available

#### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<u>Results article</u>	results	01/02/2016		Yes	No
<u>Results article</u>	results	01/02/2017		Yes	No
<u>Results article</u>	results	14/03/2017	20/12/2019	Yes	No