Fighting against hospital malnutrition in children using MUAC as a screening tool

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Brief summary

Hospital malnutrition is largely underdiagnosed. We are convinced that only a simple tool will improve malnutrition detection in children. Measurement of the mid-upper arm circumference (MUAC) is a validated tool mostly used in the context of humanitarian medicine. Present study aims to determine MUAC cut-off values in order to use it as a simple screening tool using a web based design over a large panel of paediatric hospitals all over France, some European countries and Africa.

Rationale

We demontrated our ability to mobilize pediatric teams toward hospital malnutrition screening conducting a pilot study in 2010 (3 centres ans 133 patients) and a large scale multicenter study in 2011 (14 centres, 956 patients, late breaking news, ESPEN 2011). Results are consistent : 10 to 15% of hospitalized children are malnourished (Figure 1). However nutritional indices are insufficiently calculated in the day to day practice. Many factors are involved; weighting and measuring the patients in proper conditions appear cumbersome for many pediatric teams particularly in emergency rooms.

This project aims to determine MUAC cut-off values in order to use it as a simple screening tool to identify patients that necessitate full clinical nutritional investigation.

Implementation

This initiative will be conducted throught a network of pediatric wards that participated in the previous studies and that will be extended to more centers in France, North Africa, Subsaharian Africa and Europe. We will include medical, surgical, general or sub speciality pediatric units and pediatric emergency rooms.

All patients included will be measured and weighted, their MUAC will be recorded and all will follow a standardized diagnostic procedure that includes search for malnutrition signs, for a somatic or psychologic origin and growth chart drawing. The diagnosis of malnutrition will be validated by a senior physician skilled in pediatric nutrition.

Non identifying data collection will be performed using an electronic CRF. Data will be analysed by the Inserm Clinical Investigation Unit epidemiological team.

Results / Outcomes (clinical perspective)

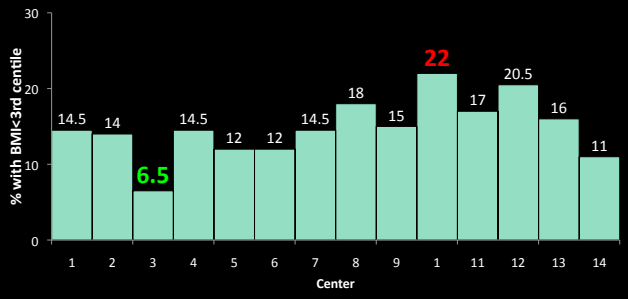
This study aims to determine cut-off values of MUAC under which a full diagnostic procedure will be mandatory to confirm the diagnosis of malnutrition. A second step will be to validate prospectively this procedure using same methodology and network (Figure 2).

The whole procedure will help to better diagnose children malnutrition and prescribe nutritional care i.e. dietetary counseling , nutritional supplements, enteral nutrition or in a few situations parenteral nutrition.

Finances

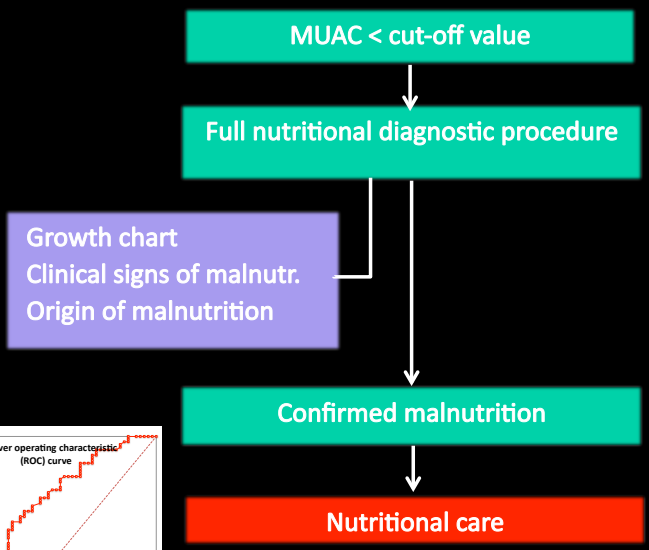
This study is part of a PhD thesis (Dr A De LUCA). Part of the grant will cover 1 study year, the rest for the logistics of the study (data management, coordination of centers).

Figure 1 : Prevalence of children with BMI < 3rd percentile



Legend : study performed in 2011, 956 patients included all over France (Late breaking news, ESPEN 2011)

Figure 2 : Full diagnostic procedure to be validated



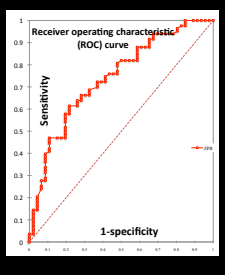


Figure 3 : ROC curve showing the ability of MUAC to predict confirmed child malnutrition.
Data obtained from a sub sample of the 2011 study presented above (n =129, area under curve = 0,74, optimal Z-score = -2). Red curve (Z-score MUAC).