Reviewer's report

Title: Are measures of wasting affected by hydration status in hospitalized children? A repeated measures study

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Reviewer: Andre BREIND

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Very interesting paper with important clinical implications.

Discretionary comment

1- General comment

The title and the introduction suggest that the paper is about assessment of wasting. This is not totally true, as most of the discussion is based on measure of mid-upper arm circumference (MUAC), which is not really an indicator of wasting. Wasting by definition is related to low weight for height, not to MUAC, and the two indicators are not interchangeable, as they identify different children. On the other hand, since 2007, both MUAC and low weight for height are accepted independent diagnostic criteria for severe acute malnutrition (SAM) (see 2009 WHO UNICEF Joint statement available at: http://www.who.int/nutrition/publications/severemalnutrition/9789241598163_eng.pdf).

And currently, many NGOs use MUAC based definition of moderate acute malnutrition.

I think the paper would avoid this problem by using a different title, namely:

“Are current diagnostic criteria for severe acute malnutrition affected by hydration status in hospitalized children? A repeated measures study”.

and by replacing the term “wasting” by “SAM diagnostic criteria” or “malnutrition” whenever it refers both to low weight for height and low MUAC. The 2009 WHO UNICEF Joint statement could be quoted.

2- minor points

p 2 - Abstract:

mid-upper arm circumference
weight-for-length z-score

In the result section, the authors say:

"Each 1% change in hydration was associated with a 0.40mm (95% CI: 0.30 to 0.44mm, p<0.001) change in MUAC, 0.035z (95% CI: 0.027 to 0.043z, P<0.001)
change in MUACz score and 0.115z (95% CI: 0.114 to 0.116 z, p<0.001) change in WFLz."

it would be more correct to say: “Each 1% change in weight…” (not hydration which was not directly measured).

Line 5 of the results section: correct: aged 6 m

Conclusion: nutritional assessment (not general assessment)

p 4 introduction: content, not “contents”

p 4 The authors could mention to support their statement that hydration has an effect on weight that in most clinical guidelines, severity of dehydration is assessed by % weight loss, which can go up to 10% and beyond. WHO and other clinical guidelines could be quoted to support this statement, in addition to ref 3 (not directly related to this topic).

p 5 Study design. Poorly described. Not clear what is a repeated measure design. Define, give a reference. Why not mentioning a before after (rehydration) comparison?

Meaning of “(before)” not clear. Explain or delete.

“MUAC, weight and height were measured and recorded, and were repeated after 48 hours.” Reword. Measures were repeated, not MUAC weight and height.

p6 The authors say children were treated according to the WHO protocol but quote an USAID document as reference. Not consistent.

“Measures were taken within 30 minutes of each other and readings were blinded from each other.” readings ? Or readers ? Or observers.

p 8: “Neither rehydration therapy, nor the starter milk formula (F75) used for stabilization of severely malnourished children are aimed at growth.”

Not explicit enough.

Suggested rewording: The composition of rehydration solution providing hardly any energy and that of the low protein starter milk formula (F-75) make deposition of lean or fat tissue unlikely or if present, negligible and unlikely to influence measures.

two lines further: change “growth” with “tissue deposition”.

p 9. No way to compare the ICC for different nutritional indices?

p 10: “In linear regression models, adjusted for age and sex, a one percent (1%) change in hydration,…” weight ?? See above.

p 11 cut-off

p 12 The authors say: Similar to our findings, the authors concluded that the anthropometric changes observed were explained by dehydration and not
malnutrition.
Replace “malnutrition” by “change in nutritional status”. Malnutrition hopefully unlikely to occur after treatment.

p 13:
“There is a controversy over the use of oral versus intravenous fluids among severely malnourished children.” Delete. No need to mention this controversy here. This study does not contribute to it, just about SAM diagnostic criteria. This paragraph makes perfect sense without this sentence.

“Many of the children would not then have fulfilled the WHO criteria for severe wasting in many of these children.”
Rephrase. Not clear.

p 15 list of abbreviations
Weight-for-height
Weight-for-age
World Health Organization.
ICC Intra Class Correlation Coefficient

References:
Ref 1 is not about malnutrition related mortality, but about prevalence of underweight. A more appropriate reference would be:

Table 2 and figure: replace change in hydration by weight change

Level of interest: An article of outstanding merit and interest in its field

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:
I declare that I have no competing interests