Optimising the management of acute malnutrition

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Acute malnutrition affects 47 million children aged under 5 years and contributes to nearly 1 million children's deaths annually worldwide. Africa and Asia bear 96% of the global burden of acute malnutrition.[1,2]

For decades, all children with acute malnutrition were treated as inpatients with fortified milk formulas. In 2007, with the introduction and widespread acceptance of ready-to-use therapeutic foods (RUTF) and ready-to-use supplementary foods (RUSF), a Community Management of Acute Malnutrition (CMAM) programme was endorsed by WHO and UN.[3] Thereby children with uncomplicated severe acute malnutrition are treated in the outpatient therapeutic programme with RUTF, whereas children with moderate acute malnutrition are managed in the outpatient supplementary feeding programme with RUSF.[4] Several low-income and middle-income countries (LMICs), including the Democratic Republic of the Congo, currently use this CMAM approach. Unfortunately, due to the underfunding of these programmes, they are hampered by many frequent stockouts of nutritional products, mainly due to their high cost. Consequently, global access to acute malnutrition treatment remains low (<20%).[5]

In this issue of *The Lancet Global Health*, Cécile Cazes and colleagues[6] assess whether a single protocol for moderate acute and severe acute malnutrition management, using only RUTF at a decreasing dose as weight and mid-upper-arm circumference increase (OptiMA strategy), could achieve similar or higher individual efficacy, increase coverage, and minimise costs compared with the current programmes recommended in the Democratic Republic of the Congo (standard strategy; one programme for severe acute malnutrition using RUTF at an increasing dose as weight increases, another for moderate acute malnutrition using a fixed dose of RUSF). The authors found that the OptiMA strategy was superior to the standard one in terms of favourable outcomes (being alive, not acutely malnourished, and with no further episodes of acute malnutrition throughout the 6-month observation period), time to nutritional improvement, and treatment cost.

These findings have several implications for approaches to acute malnutrition treatment. First, in several conflict or food-insecure zones, interventions are mostly focused on severe acute malnutrition management. Consequently, the moderate acute malnutrition programmes are only partially functional or non-existent. Yet, moderate acute malnutrition is more prevalent than severe acute malnutrition (31 million children *vs* 14 million children),[1] it can easily progress to severe acute malnutrition, and the risk of mortality is three-times compared with well nourished children.[7] The OptiMA strategy appears to be more effective in terms of treating more children (both moderate acute malnutrition and severe acute malnutrition) at the same time, in a single programme, and also in preventing severe acute malnutrition from developing (only 5% of children with moderate acute malnutrition in the OptiMA group deteriorated to severe acute malnutrition within 6 months, compared with 16% in the standard group).

Second, the current standard strategy of separating the treatment of moderate acute malnutrition and severe acute malnutrition into two different programmes appears to be more expensive because they are staff-intensive and require both RUTF and RUSF. By integrating moderate acute malnutrition and severe acute malnutrition treatment into one programme, and using only RUTF, the OptiMA strategy provides major advantages in allowing more children to access treatment at a lower cost. This finding is interesting for LMICs experiencing stock-outs of nutritional inputs due to underfunded programmes.

Finally, although the trial was performed and supervised by well trained staff and there was close follow-up, 235 children (135 [30%] of 446 in the standard group *vs* 100 [22%] of 450 in the OptiMA group) relapsed after their nutritional recovery. The standards set by the SPHERE humanitarian charter focus on short-term successes only, despite evidence of high post-treatment relapse and mortality highlighted by several reports.[8,9] In this trial, monitoring the children 4 months after their nutritional recovery allowed diagnosis of these relapse cases. This finding emphasises the need to implement a follow-up policy for children following discharge from nutrition programmes as there is a potential risk of relapse in areas of food insecurity.

Several key questions still need addressing. First, in resource-poor settings, the high cost of RUTF and RUSF limits their availability. Several non-inferiority,

randomised controlled clinical trials were conducted in the Democratic Republic of the Congo and in Malawi comparing the efficacy of cereal-based formulas (maize, sorghum, and soya) mixed with vegetable oil and sugar with that of standard peanut paste-based RUTF for treating acute malnutrition. Findings from these trials suggested the non-inferiority of cereal-based formulas compared with peanut paste-based RUTF for children's recovery rate, weight gain, and length of programme stay.[10,11] Thus, these cereal-based formulas RUTF should be encouraged as an alternative nutritional therapy because of their availability and lower cost in resource-poor settings.

Second, several metagenomics studies in children with malnutrition provided evidence that microbiota immaturity was involved in the development or maintenance of malnutrition.[12,13] Current evidence suggests that RUTF and RUSF are insufficient to permanently restore gut microbiota maturity, which returns to an immature state 4 months following nutritional treatment.[14] Further studies should examine the use of the combined action of nutritional and microbiota-targeted interventions to permanently restore the gut microbiota and thus improve the nutritional status of children with malnutrition. Some encouraging results have been reported among children with malnutrition in Uganda treated with a combination of RUTF and probiotics.[15]

Finally, malnutrition is the result of a complex set of determinants, the most important being food insecurity and infections. Nutritious, diversified, and safe foods, and a healthy environment encompassing access to basic health services, water, sanitation, and hygiene[16] are other keys to prevent relapse and death of these children following their nutritional recovery.

We declare no competing interests.

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