

Putting back the management of severe malnutrition on the international health agenda

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Severe malnutrition, defined by severe wasting (weight-for-height < -3 Z-scores or < 70% of the median NCHS/WHO reference) and/or the presence of nutritional oedema, is a life threatening condition requiring urgent treatment. How many lives would better treatment of severe child malnutrition save?

The prevalence of severe malnutrition is estimated as around 2 % in least developed countries and 1% in other developing countries (1) translating to about 10 million severely malnourished children at one time. About 10 million children die each year (2, 3), of which some 4 million are neonatal deaths, not generally preventable by addressing severe malnutrition. Malnutrition, severe or otherwise, is estimated to be a contributing factor in over 50% of child deaths (4) and it is estimated that the reduction in child mortality and morbidity (i.e. DALY loss averted) if malnutrition was eliminated would be at least one third (5). No direct estimates are available of the contribution of severe malnutrition to child deaths. However, the figure suggested by Collins et al, in this volume (6) of possibly 1 million child deaths (out of 6 million) associated with severe malnutrition is certainly possible. This estimate should be confronted with other sources of data (7) but nevertheless its order of magnitude suggests that severe malnutrition in children is an important public health problem.

Moderate malnutrition contributes more to the overall disease burden than severe, as it affects many more children, even if the risk of death is lower (8). Moreover, *preventing* all forms of malnutrition remains the priority. But existing prevention programmes are imperfect, especially in poorest countries or in countries undergoing an emergency crisis, and moderate plus severe malnutrition (as underweight) persists at around 25%, only falling slowly. Many children still go on to become severely malnourished even when prevention programmes are in place, and these children will require treatment. Hence therapeutic programmes are still needed as "safety nets" in parallel with prevention programmes.

Thus extensive benefit would ensue from more effective and widely available treatment of severe malnutrition. Yet until recently developing and applying better treatment methods has had low priority – severe malnutrition can almost be regarded as a neglected disease. For example, in the Lancet series on child survival, management of severe malnutrition is not mentioned as a potentially life saving intervention (3). Similarly, international agencies have expressed a strong commitment to achieving Millennium Development Goals (MDG); in this context numbers one (to eradicate extreme poverty and hunger) and four (to reduce child mortality) are the most relevant. But large-scale programmes of treatment targeted towards severely malnourished children are not yet widely supported. Few countries, if any, even among those with a high prevalence of malnutrition, have a clear national policy aiming at detecting and treating severely malnourished children.

A possible reason for this apparent neglect is that until recently there was no clearly effective treatment strategy to prevent deaths from severe malnutrition on a large scale. Well-

understood and evidence-based methods of treatment now exist. These have been systematically developed through research and development of protocols and suitable products; then by extensive efficacy testing under controlled conditions; and now the experience of widespread field implementation – as yet mainly in emergencies – leads to recommendations, as laid out in this publication, for routine adoption, both under emergency conditions and other appropriate circumstances.

This is a significant advance. Until recently, the WHO recommendation was to admit severely malnourished children to hospital as inpatients for a period of at least a month (9). The limitations of a hospital-based approach for a condition affecting large numbers of children, particularly when hospital capacity is poor, have been recognized for more than 30 years (10,11). Moreover, hospital stays of several weeks for a child and mother are disruptive for families, especially when the mother has other children at home or when her labour is essential for the economic survival of the household. As a result, hospital-based management of severe malnutrition was perceived as efficacious, but not effective on a large scale, neither as part of routine health services, nor in emergencies (12).

However, although some of these problems could in principle be overcome by a community-based approach, this was rarely effective until new products and procedures started to be tested in the 1990's, as discussed by Ashworth in this issue of the Food and Nutrition Bulletin (13). The situation is now ready to change with the implementation of effective community-based intervention strategies for management of severely malnourished children without complications, which hitherto had required hospital care.

The first step in this potential transformation came with development of new therapeutic diets. Previously, high-energy milk products had been used, even when appetite was good enough for the child to take non-liquid foods. Ready-to-use therapeutic foods (RUTF) were developed as an alternative, in the form of energy-dense pastes or biscuits containing no water so they do not support bacterial growth (which is a major drawback of milk-based liquid diets). These were shown to be efficacious in obtaining rapid weight gain (14, 15), and furthermore can be used in the community. This combination of safer therapeutic foods and their feasible use in the home has begun to transform the way severe malnutrition is managed in the community both in emergency and non-emergency settings (16). Addition of adapted mineral and vitamin supplement to the local diet seems also to increase the efficacy of programmes based on the use of locally available nutrient rich foods, but this approach requires further research to determine its effectiveness (17).

The local production of RUTF is described in the paper by Manary in this volume (18). The energy-dense RUTF products were tested in a number of experimental settings, and shown to be efficacious in treatment of severe malnutrition. Mortality rates were low, and rapid rates of recovery achieved, comparable or even exceeding pre-existing approaches. A proviso is that

severe malnutrition with complications, especially when appetite is poor, does not respond well and still requires in-patient treatment including liquid diets. The efficacy studies are described and synthesized in the paper by Ashworth in this volume (13).

Large-scale community-based approaches, using RUTF, were first implemented in emergency settings, where agencies "voted with their feet" in the last two years increasing dramatically the number of severely malnourished children they could treat (19). Data from these real-life, non-experimental programmes necessarily provide for less rigorous evaluation, but the indications are that the impact in terms of mortality reduction and success of rehabilitation are extensive. Implementation and results are described by Collins et al in this volume (6).

It is likely that the same approach can be used successfully on a large scale in communities in non-emergency settings, as well as in conjunction with hospital-based management of children with complications, and this has the potential to vastly increase the coverage of effective management of severely malnourished children. However, upscaling these programmes at a national level in countries with the highest prevalence of severe malnutrition will represent a challenge that should not be underestimated. From a Non Governmental Organisation's experience, the paper by Gatchell et al in this volume (20) described issues to be addressed for the community-based management of severe malnutrition to be sustainable. Nonetheless, community-based health and nutrition programmes today have considerable coverage (21), and being based on local health workers and community organizations, may well provide a route for wider adoption of RUTF for treatment of severe malnutrition, where this is a significant problem; put the other way, a missing component of such programmes has been the ability to treat severe (uncomplicated) cases without referral and admission, and RUTFs may fill this gap.

This special issue of the Food and Nutrition Bulletin reports on a WHO/UNICEF/SCN meeting on community-based management of severe malnutrition in children, that took place in Geneva on the 21-23rd November 2005 and brought together some 50 international experts and representatives from WFP, UNHCR, Red Cross, research institutions, major international NGO and representatives of Ministries of Health. It describes the recent developments and the emerging consensus taking place in this rapidly evolving area. As a background for discussion, WHO commissioned five papers, which examined the current state of knowledge concerning:

- Methods to detect cases of severely malnourished children in the community;
- Efficacy and effectiveness of community-based treatment of severe malnutrition;
- Key issues in the success of community-based management of severe malnutrition;
- Local production and provision of ready-to-use therapeutic food for the treatment of severe malnutrition;
- Sustainability of programmes of community based management of severe malnutrition.

The papers are published in this issue together with the meeting report. Field guidelines will be developed based on the general principles, conclusions and recommendations derived from this meeting which, if implemented on a large scale, will prevent thousands of child deaths. Let us hope that these developments will contribute to putting the detection and treatment of severe malnutrition on the international agenda for child survival – and to successfully treating many more malnourished children than are reached today.

References

1. UNICEF Global Database on Child Malnutrition. 2005. Available at: <http://www.childinfo.org/areas/malnutrition/wasting.php>
2. Black et al. Where and Why are 10 Million Children Dying Every Year? *The Lancet*, 2003; 361: 2226-2234.
3. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS and the Bellagio Study Group. How Many Child Deaths Can We Prevent This Year? *The Lancet*, 2003; 362: 65-71.
4. Caulfield LE, de Onis M, Blossner M, Black RE. Undernutrition as an underlying cause of child deaths associated with diarrhea, pneumonia, malaria, and measles. *Am J Clin Nutr*. 2004; 80(1):193-8.
5. Mason, J.B., Musgrove, P., and Habicht, J-P. (2003). At Least One-third of Poor Countries' Disease Burden is due to Malnutrition. Disease Control Priorities Project. DCPD Working Paper No. 1. FIC/NIH. March 2003. <http://www.fic.nih.gov/dcpp/wps/wp1.pdf>
6. Collins S, Key issues in the success of community-based management of severe malnutrition. *Food Nutr Bull*, this issue.
7. Adjuik A, Smith T, Clark S, Todd J, Garrib A, Kinfu Y, Kahn K, Mola M, Ashraf A, Masanja H, Adazu U, Sacarlal J, Alam N, Marra A, Gbangou A, Mwageni E, Binka F. Cause-specific mortality rates in sub-Saharan Africa and Bangladesh. *Bull WHO*; 84: 181-8. Available at: <http://www.who.int/bulletin/volumes/84/3/181.pdf> Accessed on March 8th 2006.
8. Pelletier DL, Frongillo EA Jr, Schroeder DG, Habicht JP. The effects of malnutrition on child mortality in developing countries. *Bull World Health Organ*. 1995; 73: 443-8.
9. WHO. 1999. Management of severe malnutrition: a manual for physicians and other health workers. WHO: Geneva.
10. Cook R. Is hospital the place for the treatment of malnourished children? *J Trop Pediatr Environ Child Health*. 1971; 17: 15-25.
11. Jelliffe DB, Jelliffe EF. The children's ward as a lethal factor? *J Pediatr*. 1970; 77: 895-9.
12. Briend A. Management of severe malnutrition: efficacious or effective? *J Pediatr Gastroenterol Nutr*. 2001; 32: 521-2.
13. Ashworth A. Efficacy and effectiveness of community-based treatment of severe malnutrition. *Food Nutr Bull*, this issue.
14. Diop el HI, Dossou NI, Ndour MM, Briend A, Wade S. Comparison of the efficacy of a solid ready-to-use food and a liquid, milk-based diet for the rehabilitation of severely malnourished children: a randomized trial. *Am J Clin Nutr*. 2003; 78: 302-7.
15. Navarro-Colorado C, Laquière S. Use of Solid Ready-to-Use-Therapeutic-Food (BP100) Vs F100 milk for Rehabilitation of Severe Malnutrition during emergencies: A Clinical Trial in Sierra Leone. *ENN Field Exchange*. 2005; 24: 22-4. Available at: <http://www.ennonline.net/fex/24/Fex24.pdf>

16. Collins S. Community-based therapeutic care. A new paradigm for selective feeding in nutritional crisis. Humanitarian Policy Network. Network paper 48, November 2004. London, ODI. Available at: http://www.validinternational.org/tbx/pages/section.cfm?index_id=40
17. Tahmeed A. Community-based nutritional rehabilitation without food distribution: Experience from Bangladesh. WHO, UNICEF and SCN Informal Consultation on Community-Based Management of Severe Malnutrition in Children. Geneva, 21-23 November 2005. Available at: <http://www.who.int/child-adolescent-health/>
18. Manary M. Local production and provision of ready-to-use therapeutic food for the treatment of severe childhood malnutrition. Food Nutrition Bulletin. This issue.
19. Tectonidis M. Crisis in Niger--outpatient care for severe acute malnutrition. N Engl J Med. 2006; 354: 224-7.
20. Gatchell V, Forsythe V, Thomas PR. The sustainability of community-based therapeutic care in non-acute emergency context. Food Nutr Bull, this issue.
21. Mason J, Sanders D, Musgrove P, Soekirman, Galloway R. (2006). Community Health and Nutrition Programs. Chapter 56, pp 1053-1074 in 'Disease Control Priorities in Developing Countries'. Eds. Jamison D et al. OUP and World Bank.