PERSPECTIVE

Management of Children with Severe Acute Malnutrition: A National Priority

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Severe acute malnutrition (SAM) among children below five years of age remains a major embarrassment, and impediment to optimal human capital development in India. The World Health Organization (WHO) and United Nations Children's Fund proposed diagnostic criteria for severe acute malnutrition in children aged 6 to 60 months include any of the following: (*i*) weight for height below –3 standard deviation (SD or Z scores) of the median WHO growth reference (2006); (*ii*) visible severe wasting; (*iii*) presence of bipedal edema; and (*iv*) mid upper arm circumference below 115 mm(1). The Indian Academy of Pediatrics recommended diagnostic criteria (2007), adapted from the earlier WHO guidelines, are weight for height/length below 70% or ≤3SD of NCHS median and/or visible severe wasting and/or bipedal edema; mid upper arm circumference criteria may also be used for identifying severe wasting(2).

Estimates from the most recent Nationally representative survey indicate that 6.4% of children below 60 months of age have weight for height below –3 SD(3). In the current Indian population of 1100 million, there would be about 132 million under five children (~12% of population), of which 6.4% or roughly 8 million can be assumed to be suffering from SAM. This colossal burden creates suspicion whether the anthropometric cut-off, primarily based on African experience, should be lowered in our setting. However, evidence suggests that this definition is not inappropriate.

Eight data sets from low-income countries (Ghana, Guinea Bissau, Senegal, the Philippines, Nepal, Pakistan, India, and Bangladesh) were used for analysis of disease risks associated with childhood undernutrition(4). The risk of death increased with descending SD scores for wasting (weight for height) and quite steeply so below -3SD. In SAM children, confounder adjusted odds ratio for overall mortality were 9.4 (95% confidence interval 5.3, 16.8); the corresponding estimates for death due to diarrhea, pneumonia and measles were 6.3 (2.7, 14.7), 8.7 (4.8, 15.6), and 6.0 (4.3, 8.2), respectively. The number of global deaths and Disability Adjusted Life Years (DALYs) in children less than 5 years old attributed to stunting, severe wasting, and intra-uterine growth restriction constituted the largest percentage of any risk factor in this age group(4). SAM was responsible for 0.45 million deaths and 6% of DALYs for children younger than 5 years. The disease burden attributable to stunting, severe wasting, and intrauterine growth restriction together was the highest in south-central Asia, where India alone had 0.6 million deaths and 24.6 million DALYs attributable to these conditions. In addition to these mortality and disease burden considerations, other factors supporting the choice of weight for height below -3SD for defining SAM include(1): (*i*) in a well-nourished population there are virtually no

children below -3 SD (<1%); (*ii*) these children have a higher weight gain when receiving a therapeutic diet compared to other diets, which results in faster recovery; and (*iii*) there are no known risks or negative effects associated with therapeutic feeding of these children, applying recommended protocols and appropriate therapeutic foods.

URGENT ACTION IS WARRANTED

India weathered the recent global fiscal crisis impressively and is relentlessly marching forward on the economic and development fronts. However, these economic gains have not translated into substantial nutritional benefits, which is acutely embarrassing and disconcerting. Protecting lives and promoting optimum development of undernourished children is a human rights issue that can no longer be swept under the carpet. Considering the serious biological consequences, particularly the extremely high risk of mortality, it is unethical to delay institution of urgent measures for prevention and treatment of SAM. The Millennium Development Goal targets of under-five mortality also cannot be achieved without according a high priority to treatment of SAM children. Finally, optimally treated survivors of SAM recover without any residual sequelae and can achieve their full genetic potential; thus the likely returns on this intervention are immense.

There is considerable unanimity about the urgent necessity of instituting public health interventions for tackling the menace of SAM. Also, there is little debate about the need to urgently universalize, further refine, and research the local adaptation(2) of the WHO recommended inpatient management for SAM(5), which has been shown to reduce mortality. According to the current recommendations, SAM children should ideally be treated in a facility. Considering the burden of SAM and the availability of hospital beds, this is not operationally feasible; thus community- or home-based management is an unavoidable alternative for a proportion of these subjects(6). However, philosophical differences are evident regarding the choice of interventions to be adopted in the community. One view favors the sole adoption of the preventive and promotive aspects (ensuring basic nutrition and health care for all infants and children, especially promotion of breast feeding and appropriate complementary feeding) with no special emphasis on active detection and nutritional therapy of SAM children. There is some merit in arguments that emphasis on the latter process will: (*i*) present an opportunity for commercialization of malnutrition through multi-national companies' product based nutrition therapy, (*ii*) erode progress in efforts to address the underlying determinants of SAM, and (*iii*) only result in transient alleviation, as the inevitable return to deprived environments will cause a relapse.

In this context, we cannot ignore historical lessons from the success story of diarrhea management in developing countries. A major reduction in diarrhea related morbidity and mortality is ascribed to the successful treatment of acute episode in the community through Oral Rehydration Solution and continued feeding. Inaction based on arguments similar to those above could have prevented this success story. Fortunately, institution and universalization of these therapeutic measures did not await diarrheal disease control through preventive and promotive interventions including breast feeding; water, sanitation and hygiene measures; and health education. We firmly believe that public health interventions for SAM must simultaneously focus on preventive and promotive aspects, and therapeutic interventions in the community. The Consensus Statement published in this issue(7) illustrates that all the above mentioned legitimate concerns regarding active detection and nutritional therapy of SAM children can be adequately addressed through multiple mechanisms and safeguards.

A valid impediment to the urgent operationalisation of community management of SAM is the paucity of local evidence, which precludes clarity about the possible therapeutic protocols and their practical implementation. Evidence related to other settings and cultures (for example, Africa) cannot be directly translated and operationalized in a diverse country like India. Some priority researchable issues in our context include: (*i*) formulation and validation of criteria for identifying the subgroup of subjects who can be safely managed in the community; (*ii*) devising and

testing practical algorithms for community management within the ambit of ongoing public health programs like the Integrated Child Development Services and Integrated Management of Neonatal and Childhood Illnesses; (*iii*) assessing alternative operational mechanisms and algorithms; (*iv*) comparing recovery and compliance with protocols based on home available foods or other indigenously manufactured medical nutrition therapy products constituted on recommended nutritional principles(8,9); and (*v*) biotechnological innovations to formulate locally acceptable, efficacious, safe and cheap medical nutrition therapy products and mineral micronutrient mix.

There is unprecedented political and bureaucratic will to address the national embarrassment of SAM, a silent life threatening emergency. The national funding agencies and Indian scientists also perceive the need for priortising this area for research. In this milieu, arguments against product based nutritional therapy in community settings should not obstruct urgent evidence creation to feed national policy. This is the opportunate moment for all stakeholders to consciously bury their individual differences and collectively make concerted efforts for addressing a national calamity. We cannot succeed without active contribution from each and every stakeholder.

Contributors: Both authors conceived and discussed the content of the commentary. UK produced the first draft, which was modified by mutual agreement. Both will act as joint guarantors.

Funding: None.

Conflict of interest: None stated.

REFERENCES

1. WHO Child Growth Standards and the Identification of Severe Acute Malnutrition in Infants and Children. A Joint Statement by the World Health Organization and the United Nations Children's Fund, 2009. Available from http://www.who.int/nutrition/publications/severemalnutrition/9789241598163/en/index.html. Accessed on June 15, 2010.
2. Bhatnagar S, Lodha R, Choudhury P, Sachdev HPS, Shah N, Narayan S, *et al*. IAP Guidelines on Hospital Based Management of Severely Malnourished Children (adapted from WHO guidelines). Indian Pediatr 2007; 44: 443-461.
3. International Institute for Population Sciences. National Family Health Survey 3, 2005-2006. Mumbai, India: International Institute of Population Sciences, 2006.
4. Black RE, Allen LH, Bhutta ZA, de Onis M, Ezzati M, Mathers C, *et al*. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet 2008; Published Online January 17, 2008 DOI:10.1016/S0140-6736(07)61690-0.
5. Ashworth A, Khanum S, Jackson A, Schofield C. Guidelines for the inpatient treatment of severely malnourished children. Geneva: World Health Organization; 2003.
6. Gupta P, Shah D, Sachdev HPS, Kapil U. Recommendations: National Workshop on Development of Guidelines for Effective Home Based Care and Treatment of Children Suffering from Severe Acute Malnutrition. Indian Pediatr 2006; 43: 131-139.
7. Sachdev HPS, Kapil U, Vir S. Consensus statement: National Consensus Workshop on Management of SAM Children through Medical Nutrition Therapy. Indian Pediatr 2010; 47: 661-665.
8. Kapil U. Ready to Use Therapeutic Food (RUTF) in the management of severe acute malnutrition in India. Indian Pediatr 2009; 46: 381-382.
9. Community-based management of severe acute malnutrition. A Joint Statement by the World Health Organization, the World Food Programme, the United Nations System Standing Committee on Nutrition and the United Nations Children's Fund, 2007. Available from http://www.unicef.org/search/search.php? querystring=Management+of+Severe+Acute+Malnutrition&hits=&isNews=. Accessed on 16 January, 2010.