The management of severe malnutrition: taking a broader view

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Perspective on the paper by Karaolis *et al* (see page 198)

The preventable, malnutrition-associated deaths of 5.6 million children each year is "a humanitarian disaster that cannot be allowed to continue".¹ A recent update using data from 2001 and the disability-adjusted life year approach confirmed that undernutrition remains the single leading cause of health loss in the world today.² Child underweight for age accounts for 8.7% of the total disease burden in people living in low- and middle-income countries, mainly countries in South Asia and sub-Saharan Africa. Specific micronutrient deficiencies are responsible for additional disease burdens.

Severe malnutrition is common in hospitals in economically poor countries. In a large study of children admitted to a rural district hospital in Kenya between 1999 and 2002, 16% (1282/8190) of children had severe wasting (weight-for-height z score ≤ -3), kwashiorkor or both. Children with severe wasting had a mortality rate of 19.9% compared with 4.4% among all admissions.³ Comparable data has been reported from West Africa.⁴

The overall responsibility for the management of severe malnutrition in hospitals falls on paediatricians. We understand the central importance of nutrition to a child's current health and the ability to reach his or her full potential for growth and neurocognitive development. Malnutrition in early childhood can result in short stature and impaired neurological development that will increase the risk of morbidity and mortality and impair performance at school and, ultimately, the ability to contribute to society in adult life.

Karaolis *et al*⁵ are to be congratulated for undertaking a well-designed, detailed review of how the World Health Organization (WHO) guidelines work in practice in exactly the type of hospitals where they are most important—rural hospitals serving an economically poor population. The research team provided a series of 2-day workshops during a 3-month period and then monthly 1-day visits for 6 months for support, ad hoc training, problem-solving sessions and

assistance with supplies. The research team then withdrew. The regional nutrition officers provided ongoing supervision, and the assessment of adherence to the guidelines and the effect on death was undertaken 12 months later.

The authors have already reported some of the findings from their assessment.⁶ Case mortality for severe malnutrition fell markedly from 46% to 21% in one hospital, but in the other, after falling initially from 25% to 18%, rose to 38% as a result of changes in staff. Several deficiencies in the implementation of the guidelines that may have resulted in deaths were identified, especially with respect to the inadequate recognition and treatment of infection. It should be noted that only about half of the children in this study were actually severely malnourished according to WHO criteria (weight-for-height z score < -3 and/or oedema), and others have reported difficulties in the identification of severe malnutrition on the basis of clinical assessment alone.⁷

This second report provides further details of how the guidelines were implemented "on the ground". There were important deficiencies in each of the 10 treatment steps at both hospitals, and usually more than one critical deficiency in each step. Of 5 checks of the availability of 11 essential supplies (micronutrients, antibiotics, oxygen), only about half were in stock at all checks. An additional concern was that preparation for discharge and arrangements for follow-up were poor, and the little data available from Africa suggests that death after discharge is common, ranging from 8% to 36%.^{8–12}

Support to the two hospitals in this study in the year before the assessment may have been inadequate, but, in view of the considerable input of training and support, these findings are clearly disappointing. But are they surprising?

The WHO guidelines for the management of severe malnutrition are based on sound nutritional and pathophysiological principles and informed by extensive clinical experience and findings from

research. It is clear that implementation of the guidelines in some settings has reduced mortality significantly.¹³ However, only the briefest of glances at table 3 in the report shows that the management of severe malnutrition is significantly more complex than that for many other common childhood diseases. It is clear that severe malnutrition poses a huge challenge to understaffed, under-resourced health facilities. A child in an industrialised country requiring this level of care would be admitted to a well-resourced intensive care or high dependency unit with one-to-one nursing. The contrast with the 19-bed ward with $>100\%$ occupancy and only 2 nurses at night at Sipetu is stark. It is no wonder that staff morale was low!

The authors highlight that the potential of carers to contribute to the care of their own children was not realised in these hospitals. Faulty child-care practices and ignorance of basic nutrition, as well as poverty, often accompanies malnutrition. A greater emphasis on training carers in basic duties such as documenting feeds and identifying danger signs may relieve some of the pressure on the nurses and also improve care at home after discharge.

The quality of care provided to children in health institutions throughout sub-Saharan Africa and other economically poor countries is frequently compromised by similar shortages of staff and resources.^{14–15} The best approach to the management of severe malnutrition where resources are limited has been a controversial topic for many years. The authors note the encouraging reports of the management of uncomplicated severe malnutrition in the community using ready-to-use therapeutic food: community-based therapeutic care.^{16–17} This has immediate advantages of easier access for rural populations, thereby allowing intervention to occur earlier in the course of the disease and improving coverage rates. Children are protected from nosocomial infection, and hospital staff can focus on children with complications who require inpatient management.

Of course, every child with severe malnourishment was once moderately malnourished, and malnutrition remains common in children living in the community, even in stable regions not affected by conflict.^{18–19} In developing countries, about 10% of children <5 years have at least moderate wasting and 2% have severe wasting.²⁰ Malnutrition illustrates well a central maxim of preventive medicine that "a large number of people exposed to a small risk may generate many more cases than a small number exposed to a high risk."²¹ Although the

risk of death rises progressively with worsening nutritional status, >80% of malnutrition-associated deaths occur in children with mild to moderate malnutrition, as these greatly outnumber children with severe malnourishment.²² These data dictate that, in addition to dealing with severe malnutrition, it is vital to intervene in children with mild and moderate malnutrition at the community level to have a greater effect on child survival.²³

Hospital-based paediatricians should take a broad view of malnutrition in their own setting and recognise its importance as an underlying factor in many illnesses. The prevalence²⁴ and predominant causes will vary in different regions. As usual, a "one size fits all" approach will not work and health interventions should be informed by the lessons learnt from both hospital and community studies. As emphasised by Unicef,²⁵ it is necessary to consider the many inter-related causes of malnutrition and develop coordinated interventions that link the community with hospital and clinic services. In addition to providing effective back-up for the care of complicated severe malnutrition, guidance and support from hospital-based experts to colleagues in the community is vital. Indeed, the process of combining both hospital and community approaches into WHO management guidelines has already begun.²⁶

The many ways that all paediatricians can contribute to the fight against malnutrition were outlined in detail recently in this journal.¹³ We can raise awareness about malnutrition as a major factor in child health and advocate for more resources. We can make a crucial contribution by ensuring that health staff are appropriately trained, and this must begin in schools of nursing and medicine.

Child survival is firmly back in the spotlight.²⁷ Improved nutrition is essential to economic development²⁸ and also to achieving probably all of the Millennium Development Goals as well as goal 4: reducing under-five child mortality by two thirds by the year 2015.²⁹ The time is

right for paediatricians to join with others in the fight against child malnutrition.

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