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In a nutshell

Intensive medical treatment of severe acute malnutrition can substantially reduce case mortality from the 30% to the 4% range.

However, community-based management using fortified ready-to-eat foods for all but the most severe cases offers a better overall public health solution.

Severe acute malnutrition

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NUTRITION RESEARCH REVIEW

Study 1: Implementing the WHO Guidelines

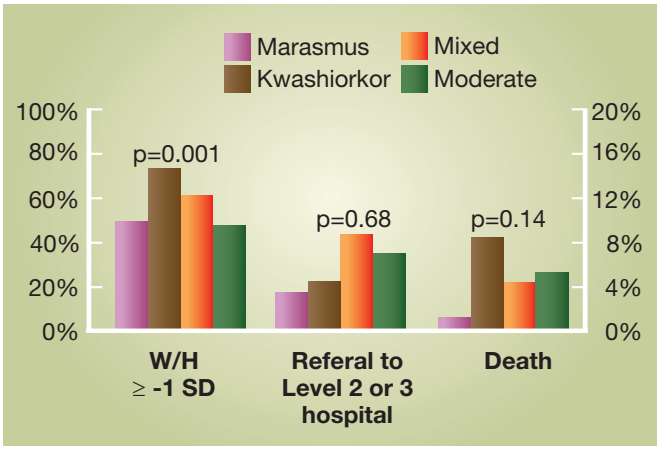
A new study from Colombia has reported on the results of working with WHO Guidelines for treatment of severe acute malnutrition (SAM) in their hospitals.

Method: Descriptive and prospective study of the clinical outcomes for 335 children under 6 yrs of age (most were under 1 yr) admitted with SAM during a 5 year period to a single class I hospital (i.e. a primary care hospital offering general level surgical and medical care) whose staff had been trained under WHO guidelines.

Results: 61% of these children had kwashiorkor, the majority had diarrhoea (68%) and anaemia (51% - mostly mild). The hospital's mortality rate for these patients fell from 8.7% in the first year of the study to 4.0% in the last year, being 5.7% overall. It was significantly higher in children with oedema - 15 of the 16 children who died had oedema (kwashiorkor or mixed malnutrition, p=0.027). Sepsis was the most common complication (9%) and nearly all the children received antibiotics. See Graph.

Ref.: Bernal C. et al. Treatment of severe malnutrition in children: experience in implementing the World Health Organization guidelines in Turbo, Colombia. J Pediatr Gastroenterol Nutr. 2008 Mar;46(3):322-8.

Graph: Clinical outcomes in SAM children
(Study 1)



Study 2: Identifying those at highest risk

A recent Kenyan study sought early identification of children at highest risk of dying from SAM.

Method: Retrospective case note review of 920 children admitted with severe malnutrition of whom 19% had died.

Results: Having ≥ 1 of the WHO-recommended danger signs (lethargy, hypoglycaemia, hypothermia) had a sensitivity in predicting early death of 52%, and specificity of 84%. Four other clinical features had high predictive value: bradycardia, capillary refill time > 2 secs, weak pulse volume, and impaired consciousness level - presence of ≥ 2 of them was associated with a nearly 10-fold increase in early case fatality (OR=9.6, 95% CI: 4.8-19, (p <0.0001).

Ref.: Maitland K. et al. Children with severe malnutrition: can those at highest risk of death be identified with the WHO protocol? PLoS Med. 2006 Dec;3(12):e500.

Study 3: Putting it into practice

A South African study looked at the practical issues of changing SAM management in rural hospitals.

Method: Prospective observational study of two rural, hospitals, where a 10 step protocol based on WHO guidelines was taught to clinical staff during 3x2-day workshops and 5x1 day follow-up visits. A year later, all 193 admissions for SAM to those hospitals were monitored for compliance with the protocol.

Results: Compliance with individual steps varied from 94% (blankets to prevent hypothermia) to under 10% (give iron supplements). Follow-up steps were the least likely to be done. Doctors' poor knowledge, nurses' inattentiveness and insufficient interaction with carers were constraints to optimal management.

Ref.: Karaolis N. et al. WHO guidelines for severe malnutrition: are they feasible in rural African hospitals? Arch Dis Child. 2007 Mar;92(3):198-204.

COMMENTARY

Severe acute malnutrition (SAM) affects ~13 million children and causes 1-2 million preventable deaths annually [1]. It is defined by presentation with either weight-for-height > 3 SDs below the mean and/or bilateral pitting oedema [1]. (Some clinicians prefer to use MUAC as a more practical means of diagnosis [2]).

SAM is frequently associated with diarrhoeal disease or HIV infection, but has many socio-environmental causes as well, such as poverty, famine, other natural disasters and war, and is more likely when these occur in places remote from help. It is common - in the current crisis in southern Dafur, for example, 11- 26% (depending on location) of the population surveyed was reported to have acute malnutrition [3].

Standard treatment protocols for SAM, such as the one published by the World Health Organisation (WHO) [4], have typically been fairly medically intensive, focused on potentially fatal complications such as hypothermia, hypoglycaemia, sepsis and heart failure, along with nutritional restoration. This is understandable, since such complications contribute to case fatality rates as high as 20-30% [1, 5-7], rates that have proved stubbornly hard to shift [8, 9].

This is not because such treatments are ineffective. Quite the opposite - when these protocols are well implemented mortality rates can be dramatically reduced, as shown in new Study 1 in which the rate halved towards the end of the intervention period to 4%, an outcome which by world standards is very good [10]. Success is helped by reliable early identification of the children at highest risk of dying - the focus of new Study 2.

But this type of treatment has one major disadvantage, which is that it typically requires in-patient hospital care, sometimes for extended periods. Children less acutely ill may still need to be managed in a specialised therapeutic feeding centre (TFC).

Unfortunately, it has long been and remains sadly true that the environments in which SAM appears are the very ones in which the hospitals available to its victims will very likely be poorly equipped to deliver that kind of treatment, for lack of diagnostic, therapeutic and trained personnel resources.

New Study 3 highlights some of those practical obstacles, for example drugs and supplements frequently being out of stock, a high turnover of staff, lack of training etc. Their findings are quite consistent with those reported in many other studies, even from less impoverished countries (e.g. Brazil [11]).

This is not to deny the importance of offering such intensive care where possible, for example when well-equipped NGOs intervene in acute catastrophes. But some experts, in looking at the wider global picture and how best to use limited resources, have criticised hospital-based approaches as being cost-ineffective [12]. There are equity issues in that these approaches will typically benefit only those who have immediate access (e.g. in large towns or refugee camps) whilst ignoring those who do not [13].

These difficulties have prompted the development of community-based therapeutic care (CTC) approaches, which focus on using intensive in-patient care only for the most serious cases, whilst treating the large majority with outpatient and home-based resources. An important part of CTC is providing home carers with fortified ready-to-use therapeutic food which does not require water to prepare. CTC emphasises community education to encourage early presentation and good follow-up. If possible it should be combined with broader public health measures to address contributing causes of SAM, such as diarrhoea [1, 14, 15].

Studies have shown that such approaches can be very effective. For one thing, they are likely to reach substantially more people at risk. CTC coverage of 74% was reported in a recent study in Malawi, compared to 25% for TFCs [16]. Compliance is much better - the default rate in a large-scale nutritional rehabilitation program in Niger was only 5.6% for home-based care, compared with 28.1% for TFCs [17]. The involvement of the community has other benefits, such as greater awareness of public health issues and better utilisation of existing health resources [18, 19]. It is clearly the most cost-effective approach [20, 21]. And most importantly, mortality rates have generally been better than the more intensive, hospital based solutions [1, 17, 22].

This does not mean CTC approaches do not present their own problems, particularly in ensuring ongoing maintenance once the acute disaster is over and highly trained NGO staff have moved on. Issues such as availability of ready-to-use therapeutic food, cooperation from government health authorities and availability of on-going training and community education are important but not easy to achieve [1, 23]. It will mean a major paradigm shift for some NGOs.

Overall, it is clear, however, that a shift towards community-based care for SAM is well justified, and indeed this approach now has the support of major agencies such as WHO, WFP and UNICEF [24]. This represents important progress in an area of crucial importance to the health of the world's children.

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