



Management of Severe Acute Malnutrition in Children

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Severe acute malnutrition (SAM), i.e. severe wasting and/or mid-upper-arm circumference (MUAC) <115 mm and/or bilateral pitting edema, remains a major killer of young children with mortality rates in preschool-aged children with severe wasting (weight-for-length/height z-score < -3SD from WHO standards median) being nine times higher than in well-nourished populations [1]. Globally, 17.3 million children, or 2.6% of the pre-school aged children, were severely wasted in 2012 [2]. With a national prevalence of severe wasting of 6.8%, or approximately 8.4 million children [3], India is home to about half the total. The response to SAM in India is thus of utmost importance to large numbers of affected children. This underscores the relevance in this issue of Indian Pediatrics of the contribution of Singh and colleagues [4] who assess the effectiveness of facility-based care for children with SAM in nutrition rehabilitation centres (NRCs) in India's most densely populated state, Uttar Pradesh, which has an average of 1.2 million severely wasted children at any given moment [4].

The program in Uttar Pradesh achieves good results in terms of survival, and reaches the recommended average weight gain and length of stay [4]. This is significant and those responsible for running the NRCs should be commended. In contrast, the prevalence of "defaulters" and "discharged, non-recovered" is very high. Two factors likely underlie the poor performance of these two program outcomes. The first relates to the discharge criterion, i.e., 15% weight gain, and the second to the absence of a community component to complement facility-based services.

For the sake of simplicity, the use of 15% weight gain had been recommended until recently as a criterion for discharge from treatment. However, since this recommendation was first made [5], new evidence has shown that a 15% weight gain is not an appropriate discharge criterion because it results in many children not so severely affected being discharged labeled as "not

recovered" as they were unable to reach a 15% weight gain. In contrast, the more severely affected children tend to have the shortest duration of treatment and be discharged while still malnourished [6]. Thus, the updated WHO guidelines on the management of SAM no longer recommend discharging children from treatment on the basis of percentage weight gain but by relying solely on anthropometric indicators, i.e. children with SAM should be discharged from treatment only when their weight-for-height/length is at least -2 Z-score and they have had no edema for at least 2 weeks, or mid-upper-arm circumference is ≥ 125 mm and they have had no edema for at least 2 weeks [6].

Another noteworthy recommendation from the updated WHO guidelines is that children with SAM who are discharged from treatment programs should be periodically monitored to prevent relapse [6]. This highlights the key role of a community-based component that not only detects SAM cases in a timely manner and provides treatment for those without medical complications, but also ensures appropriate follow-up after discharge [7]. This component is currently lacking in the approach taken in Uttar Pradesh, and its establishment could greatly benefit the many program "defaulters". A detailed review of the community-based management of severe malnutrition in children can be found elsewhere [8]. Essential to this approach is the availability of appropriate therapeutic foods that are ideally locally produced and follow WHO specifications for Ready-to-use therapeutic foods [7].

The provision of appropriate doses of vitamins and minerals is indispensable to the recovery of SAM children. In Uttar Pradesh, the locally prepared therapeutic formula meant as a substitute for F-75 and F-100 does not include an electrolyte-mineral solution [4]. The paper by Singh and colleagues mentions that children admitted to the NRCs were administered micronutrients (namely, vitamin A, folic acid, zinc, potassium and magnesium) in sufficient doses



during their stay. However, it is not clear how this was done, e.g., as drops or by other means. Ideally, the vitamins and minerals should be part of the therapeutic food [7].

The program in Uttar Pradesh covers children 6-59 months of age [4]. Infants less than 6 months are excluded as they are thought to be protected from SAM by breastfeeding. However, since the release of the WHO Child Growth Standards, SAM is now increasingly recognized in young infants [9]. In addition to etiologies such as low birth weight, persistent diarrhea and other underlying diseases or disability, the development of SAM in this age group commonly reflects suboptimal feeding practices. To achieve optimal nutrition and the greatest protection against infections, infants below six months should be exclusively breastfed. Yet, rates of exclusive breastfeeding worldwide remain disappointingly low, with only an estimated 25–31% of infants who are 2–5 months of age being exclusively breastfed [1]. Greater vulnerability among young infants results in SAM associated with higher mortality in this age group than in older infants and children [6]. The updated WHO guidelines [6] include recommendations for managing infants with SAM below six months taking into consideration the important physiological differences between them and older children.

Successes or failures occurring in the management of SAM in India will drive progress in fighting severe malnutrition worldwide. Notwithstanding the importance of treating affected children, long-lasting progress is contingent on investing in primary prevention. Preventive interventions may include improving access to high-quality foods and health care, improving nutrition and health knowledge and practices, promoting exclusive breastfeeding for the first six months of life and continued breastfeeding with improved complementary feeding practices for children aged 6–24 months that focus on ensuring access to locally available age-appropriate foods, and improving water supply and sanitation systems and hygiene practices to protect children against communicable diseases [7].

Because severe acute malnutrition occurs mainly in families with limited access to nutrient-rich food and that are living in unhygienic conditions, preventive programs are hugely important in the context of poverty. Meanwhile, children who are already suffering from SAM require treatment based on national protocols that

follow evidence-informed guidelines and have a strong community-based component that complements facility-based services.

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