



Original Research Article

Clinical Profile and outcome of Severe Acute Malnutrition (SAM) Children admitted in Nutrition Rehabilitation Centre, City Hospital, Berhampur, Odisha

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Abstract

Background: India has one of the highest number of severely malnourished children in the world. It is estimated that around 93.4 lakh children are having severe acute malnutrition (SAM) as per National Family Health Survey (NFHS) 4 and out of this, 10 per cent of SAM with medical complications may require admission to Nutrition rehabilitation centre (NRC). In Odisha, despite laudable progress in reducing child under nutrition between the last two rounds of the NFHS survey (1998-99 and 2005-06; child underweight declining from 54% to 44% respectively) and at a faster rate than the national average, there has been little change in SAM children. While no national level survey data have been made available since the NFHS-3 (2005/6), many independent assessments report note that malnutrition levels in the state remain stubbornly high. Severe acute malnutrition (SAM) continues to be an important cause of mortality. Critical care, management of infections, nutritional therapy followed by nutritional rehabilitation is a very important aspect for these children. The present study was, therefore, undertaken to evaluate incidence and clinical profile of patients admitted with severe acute malnutrition in Odisha.

Objective: To assess the clinical profile of SAM among children aged 1–59 months in the NRC of a District Headquarter Hospital (DHH), Berhampur

Materials and Method: A hospital based prospective study was carried out from- 1-12-2016 to 30.11.2017. A total of 223 children who were admitted to NRC were enrolled in this study and their data was compared and evaluated.

Results: Out of the 223 enrolled in the study, 54.3% were female. 63.4% were in the age group of 7-24 months. 48.4% belonged to schedule cast. 55% of the children stayed between 7-15 days. The most common co-morbid condition was anemia (94%) followed by pneumonia or other ARIs (28%). Out of these 84% had z score < -3 SD. The recovery rate was 85%. Mean duration of stay was 14 days. Cure rate was 85%. Defaulter rate was 7%. Average weight gain was 12gms/kg/day. Follow up rates were 72%.

Conclusions: With cure rate of 85% and no deaths, NRCs provide live-saving care for children with SAM as demonstrated by the high survival rates of the program. Community-based therapeutic care for children with uncomplicated SAM needs to become a key component of the continuum of care for children with SAM.

Keywords: NRC, Outcome, Severe acute malnutrition.

Introduction

UNICEF estimated malnutrition (45%) to be the most common cause of under 5 mortality in India and Nigeria accounting for more than 1/3 rd of the deaths. In India prevalence of SAM is 6.4% in children below 5 years of age with 100 focus districts having high prevalence of malnutrition being situated in 6 states, Bihar, Jharkhand, MP, Rajasthan, Odisha and UP. For proper utilisation of funds and management there is phase wise implementation of NRCs in these areas by UNICEF. It is important to identify the treatment outcome from these NRCs.

Severe acute malnutrition is defined by a very low weight for height (below $-3z$ scores of the median WHO growth standards), by visible severe wasting, or by the presence of nutritional oedema^[1]. Decreasing child mortality and improving maternal health depend heavily on reducing malnutrition, which is responsible, directly or indirectly, for 35% of deaths among children under five. SAM remains a major killer of children as mortality rates are nine times higher than those in well nourished children.

Although the median under-five case-fatality rate for severe acute malnutrition typically ranges from 30% to 50%, it can be reduced substantially when physiological and metabolic changes are taken into account. Management of severe acute malnutrition according to WHO guidelines reduced the case-fatality rate by 55% in hospital settings and recent studies suggest that ready-to-use therapeutic foods, can be used to manage severe acute malnutrition in community settings. In order to train health workers in applying this scheme WHO has created a course which, with the aid of institutional partners in Bangladesh, Chile, Gambia, Malawi and the UK, has been conducted in countries in the African, South-East Asia and Western Pacific Regions.

In India, the inpatient model for treatment of severe acute malnutrition (SAM) is still the only model approved at the national level. To date, just a few states have opened up to the community-based management of acute malnutrition

(CMAM), such as Rajasthan and Odisha. Inpatient facilities to treat SAM children in India are often called Nutrition Rehabilitation Centres (NRCs) or Malnutrition Treatment Centres (MTCs).

Recently, data from a number of different studies shows that this model of treatment has not been performing adequately. It shows that the recovery rates of SAM children attending the inpatient facilities are still low and the defaulter rate is high when compared to the acceptable minimum standard. The recovery rate varies widely in India from state to state and can be as low as 37%. In all the studies, the recovery rate was well below the 75% standard set by SPHERE. This confirms the well-recognised urgent need to revise and update the model of SAM management in India.^[6]

Methods

This is a retrospective data of SAM children admitted to NRC from 1-12-2016 to 30-11-2017 at District headquarter hospital, berhampur, Odisha. Institutional ethical clearance was obtained before under taking this study. Data of the children fulfilling the WHO criteria for SAM, between the age group of 1m to 59 m, were included in the study.

The WHO criteria to identify SAM in infants more than 6 months and within 59 months of age are, weight-for-height less than $-3SD$ and /or, visible severe wasting and/or, Mid Upper Arm Circumference (MUAC) <11.5 cm and/or edema of both feet. The criteria to identify SAM in infants less than 6 months of age are, edema of both feet and/or weight for length less than $-3SD$ (in infants with length more than 45 cm)and /or visible severe wasting in infants with less than 45 cms.^[4]

The following data were collected for the analysis like age, sex, criteria for admission, associated medical complications, type of feeding, immunisation status, response to the treatment, duration of stay in the hospital, extent of weight gain, or weight loss, discharges, discharges against medical advice, readmissions, referrals and death.

WHO protocol for the management of these SAM children were strictly adhered. The diet F75 and F100 given to these children were prepared in the NRC kitchen. Once stabilized, home based food was started. All the data were analyzed to know the quantitative indicators of the NRC. The quantitative indicators of the NRC are recovery rate, death rate, defaulter rate, weight gain and length of stay. These indicators are also indicative of the outcome of these children admitted to NRC. The objective of the analysis presented here is to assess the effectiveness of NRC in providing therapeutic care for children with SAM in Odisha.

Results

223 children were fulfilling the criteria for admission to NRC during the study period. Weight for height of all these children were below -3SD. 102 (45.7%) were male and 121(54.3%) were female. There were 5 (2.2%) of children belonging to the age group of < 6 months and 139(62.3%) were between 6-24 months. Children between 25 months-60months were 79(35.4%) and between 6 months to 24 months were 139 (62.3%).[Table 1].The mean duration of stay at NRC was 14 days.12(5.3%)children stayed for <7 days. 123(55%) children stayed for 7-15days and 88 (39.4%) children stayed for >15days.[Table 2].206(92.3%) of the children showed some weight gain during the hospital stay. The average weight gain was 12gm/kg/day.>15% weight gain was seen in 191(85.6%), 15(8.4%) gained <15% weight gain.4(1.79%)children did not show weight gain.13(5.8%) were defaulters.[Table 5]. Distribution of various complications shows anemia followed by pneumonia, anorexia, diarrhoea, fever, hypoglycemia were major complications associated with SAM [Table 4] with pneumonia (28%),anorexia 75(33.6%), diarrhoea 22(9.8%),anemia 210(94%) and fever 15(6.7%). [Table 3].The quantitative indicators of the NRC were as follows, the recovery rate was 85%,the death rate was 0%,the defaulter rate was 7%, mean weight gain was 12gm/kg/day and mean duration was 14 days [Table6]

Table 1-Age Distribution

<6 Months	5(2.2%)
6-24 Months	139(62.3%)
25-60 Months	79(35.4%)

Table 2-Duration of Stay

<7 days	12(5.3%)
7-15 days	123(55%)
>15 days	88(39.4%)

Table 3-Major Complications of SAM

Pneumonia	63(28%)
Anorexia	75(33.6%)
Diarrhoea	22(9.8%)
Anemia (mild, moderate and severe)	210(94%)
Fever	15(6.7%)

Table 4-Complications Associated with SAM

Pneumonia,ARI and LRTI	63
Anorexia	75
Diarrhoea	22
Fever	15
Severe Anemia	10
Hypoglycemia	4
Dehydration	2
Jaundice	1
Vomiting	2
Skin Lesions(dermatitis,ulcer)	6
Rickets	1
AOM	3
Cerebral Palsy	7
Global Developmental Delay	2
UTI	3
Congenital Heart Disease	4
Congenital Cataract	1
Otitis	1
Monoparesis	1
Total	223

Table 5-outcome

Discharge with >15% Weight gain	191(85.6%)
Discharge with <15% Weight gain	15(8.4%)
Non responders	4(1.7%)
Defaulters	13(5.8%)
Death	0

Table 6-Outcome Indicators of NRC

Recovery Rate	85%
Death Rate	0
Defaulter Rate	5.8%
Weight Gain (mean SD in gms/kg/day)	12
Length of stay (mean SD in days)	14
Bed occupancy rate	84%
Follow up rate	72%

Discussion

NRC is a place where SAM children are managed methodically and scientifically. NRC attached to a tertiary level hospital has the added benefit of proper management of complicated SAM like shock and sepsis.^[5] Many of our children got discharged when once the complications were under control. Acute respiratory tract infections and Acute Gastroenteritis were the common associated complications in SAM children- 33.36% (85) of pneumonia and 18.89 % (48) of diarrhoea cases in Bharathi et al similar findings were found in our study.^[2] Anaemia was the other common complication, 94% in our study when compared to 20.1% in other studies.^[6] Our NRC achieved good outcome with respect to recovery rate of 85%, Death rate of 0% and 5.8% defaulter rate is acceptable according to the WHO protocol. Critically ill patients were referred to nearby MKCG Medical College for ICU care, this amounted to zero death in our study.

The recovery rate in our study was good, 81% as against other studies where it was 33.6% in Mahama Saaka et al and 66% in Maurya et al.^[3,7] The mean weight gain which was similar in our study when compared to other studies- 14gm/kg/day.^[8] The defaulter rate was better in our study, 5.8%, when compared to 53% in the Mahama et al study.^[3] Limitation of our study was inadequate follow up. Hence, Hospital based management of these children in specialised feeding centre is very important for faster recovery and a better weight gain. Thus improvement in nutritional status is necessary in the severely malnourished children at NRCs to have a better outcome.^[9]

Conclusion

With cure rate of 85% and no deaths, NRCs provide live-saving care for children with SAM as demonstrated by the high survival rates of the program. A community based program for the management of SAM without complications and for those who are to be followed up after NRC care should be in place to complement the

services of NRC. Moreover, each child should be line listed and tracked in the community before and after discharge using the available health care/ICDS\ASHA workers and the system of mother child tracking system(MCTS)/mobile phone SMS. Research and development consensus on locally prepared therapeutic food proxies as used in the regional NRCs should be considered as a national priority.

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