



Clinical and Demographic Profile of Children with Severe Acute Malnutrition (SAM) admitted in Nutritional Rehabilitation Centre at Tertiary Care Hospital in Gujarat

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Abstract:

Background

Malnutrition in children is widely prevalent in India. The prevalence of SAM, severe underweight, and stunting is 29.4%, 15.1% and 15.1% respectively. Emphasis is laid on management of children with SAM due to 9 times higher risk of mortality in these children. The objective of this retrospective study was to assess the demographic and clinical profiles of patients with SAM, and assess effectiveness of NRC with relation to short term outcomes.

Methods

All patients with SAM admitted in NRC from April 2016 to March 2017 were reviewed. Variables assessed were gender, age at presentation socio- economic criteria, residence and mean weight gain. Inclusion criteria used were anthropometric and clinical criteria used for classification of SAM.

Results

129 patients were admitted with Severe Acute Malnutrition. 46% were female, 65% children were coming from families below poverty line, 69% were from rural areas surrounding Vadodara. Commonest co- morbidity associated with SAM was lower respiratory tract infections 30.2%, followed by diarrhea 24.8% and sepsis 18.6%. Outcomes were successful discharge in 93%, mortality in 6%, and default in 0.07%. Mean weight gain was 7.4 gm/kg day. 78% of children gained at least 15% from baseline weight. Complete follow up visits were done in 57% patients.

Conclusion

There is an increasing emphasis on screening and management of children with SAM. India being a country with populations at extremes is vulnerable to Malnutrition. Majority of patients are from rural areas. Therefore strengthening of rural health sector for surveillance and prevention of malnutrition is required.

Keywords: Severe acute malnutrition, Malnutrition, WHO, NRC, Complications

1. Introduction

Childhood nutrition is an important aspect of development goals of any country. Childhood under nutrition is an important public health issue and challenge in India. Severe Acute Malnutrition (SAM) is defined as a weight-for-height measurement of $<-3SD$, presence of bilateral pitting edema of nutritional origin, or mid-upper-arm circumference of less than 115 mm in children age 1-5 years^[1]. Emphasis is laid more on Management of SAM due to nine times higher risk of mortality than in well-nourished child.^[2]

At any point in time, an average eight million Indian children under age five years are severely wasted and are susceptible to acute complications, mortality and long term sequel. [2] There is an indirect as well as direct correlation of mortality in children with SAM. Malnutrition is an important contributing factor for most deaths amongst children suffering from common childhood illness, such as diarrhea and pneumonia. [3-5] Mortality can be prevented if timely action is taken with regard to nutritional rehabilitation and management of complications in children with SAM. [3,5]

Prevalence of Under Weight, Severe acute Malnutrition and Stunting is 29.4%, 15.1%, and 15.1% in India [5]. So, in the state of Gujarat in Western India, Government of Gujarat had initiated establishment of Nutritional Rehabilitation Centers (NRCs) and Child Malnutrition Treatment Centre (CMTC) at district hospital and community level in 2012 under "Mission Balam Sukham" [6]. NRCs are being set up in the health facilities for inpatient management of severely malnourished children. Children fulfilling criteria for SAM according to WHO criteria are admitted in NRC with counseling of mothers for proper feeding, medical management, and discharged after completion of required NRC stay and requisite weight gain. Management is done based on WHO and IAP guidelines for malnutrition. 3 follow up visits are done post discharge. [5]

2. Objectives

1. To assess the demographic and clinical profile of patients with SAM.
2. To assess the short term outcomes in form of successful discharge, mortality and effective weight gain.

3. Methods

Retrospective cohort study was done over one year from April 2016 to March 2017 in NRC at GMERS Medical College and General Hospital, Gotri Vadodara, Gujarat. Children in age group of 0-5 years were admitted in NRC. Patients were actively screened in community by Aanganwadi workers and referred to our NRC. All children coming for routine visit and illness were actively screened at our hospital for SAM. All the children with SAM admitted in the NRC during the study period were included in the study. At the NRC, age, weight, height/length, MUAC, presence or absence of bilateral edema and appetite were assessed in all the children.

4. Admission criteria

The criteria for admission for inpatient treatment in NRC were as follows:

5. Infants less than 6 months

Infant is too weak or feeble to suckle effectively (independently of his/her weight-for-length) or WFL (weight-for-length) < -3SD (in infants >45 cm) or Visible severe wasting in infants.

Children 6-59 months classified as SAM on basis of anthropometric and clinical criteria

1. WFH < -3SD with or without any grade of edema or
2. MUAC less than 11.5cm or
3. Bilateral pitting edema with Failure of Appetite Test or associated complications like hypothermia, persistent vomiting, lethargic, unconscious, convulsions, hypoglycemia, severe anemia Hb<4, sepsis, extensive skin lesions. [5]

We have 15 bedded NRC with separate kitchen and Toy room. Consultant pediatricians along with medical officers attend to medical complications and guide the nutritionist regarding nutritional rehabilitation.

Children were considered successfully discharged from the NRC when

- 1) The child had no signs of bilateral pitting edema, fever, and/or infection.
- 2) The child had completed all age appropriate immunizations.

- 3) The child was being fed 120-130 kcal/kg weight/day
- 4) adequate weight gain i.e. 15% of weight gain at presentation in a non -edematous child
- 5) The primary caregiver is confident to care for child at home. ^[3,5]

Patient details including name, age, sex, address, anthropometry and outcome indicators were taken. Weight at the time of admission and discharge was recorded and average weight gain was calculated. Data was entered into Microsoft excel spreadsheet and descriptive statistical analyses was done by SPSS Software.

6. Results

Table 1 showing demographic and anthropometric profile of patients with severe acute malnutrition. There was no statistical difference in gender distribution in SAM. 77 (59.7%) SAM children were partially immunized for age which was found to be statistically significant in comparison with completely immunized for age ($p < 0.05$). Majority of the children 90 (69.5%) were from rural areas which was found to be statistically significant ($p < 0.05$).

As shown in Table 2, Commonest co morbid condition observed was pneumonia 39(30.2%) followed by gastroenteritis 32(24%) and Sepsis 24(18.6%). Table 3 clearly depicts that sepsis was the most common complication in the study 24(18.6%) followed by hypothermia 14(10%). Outcomes of these admitted patients in accordance with WHO objective in effective management of SAM is shown in Table 3. Average weight gain was 7.4 gm/kg/day.

7. Discussion

129 patients were admitted in our NRC. There was no statistical difference in sex distribution of admitted patients. Other studies suggest a difference in sex distribution in children with SAM. 69.7% of patients with SAM were residing in rural areas. Similar presentation was observed in other studies. Commonest co morbid condition observed was pneumonia followed by gastroenteritis. Studies in developing countries as well as different parts of India show similar results. Sepsis (18.6%) was the most common complication followed by hypothermia (10%) in the study. This was corroborated in studies conducted at Nepal and Rajasthan. ^[7,8]

Discharge, default rate and death rate were 120(93%), 08(06%) and 01(0.07%) respectively. These outcomes are in accordance with WHO objectives in effective management of SAM. ^[9-11] This proves that effective medical and therapeutic management can reduce the risk of mortality in children. Average weight gain achieved was 7.4 gm/kg/day and 78% of children gained at least 15% from baseline weight.

Hence, we can conclude that Severe Acute Malnutrition is a problem that needs to be tackled aggressively NRCs are well supported by the government. Strengthening of the rural health sector for immunization, active screening for common childhood illnesses as per IMNCI program can lead to early detection, arrest and correction of growth deceleration in our children. Community management of SAM and introduction of RUTF is the next step that will reduce the prevalence of SAM in long run.

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Table 1. Demographic and Anthropometric profile of patients with severe acute malnutrition admitted in NRC (N=129)

Variables		Number	Percent
Sex	Male	69	53.4
	Female	60	46.5
Age	<1 year	12	9.3
	1-2 years	47	36.4
	2-5 years	70	54.2
Residence	Urban	39	30.2
	Rural	90	69.7
Immunization	Complete	52	40.3
	Partial	77	59.6
Socio economic status	Below poverty line	85	65.8
	Above poverty line	44	34.1

Table 2. Co morbidities in SAM patients admitted in NRC (N =129)

Comorbidities	Number	Percent
Pneumonia	39	30.2%
Acute gastroenteritis	32	24.8%
Sepsis	24	18.6%
Urinary tract infections	13	09%
Tuberculosis	4	03%
Post measles state	2	1.5%
HIV infection	1	0.1%

Table 3. Complications and Outcome of SAM patients admitted under nutritional rehabilitation program at NRC (N=129)

	Number	Percent
Complications		
Sepsis	24	18.6%
Hypothermia	14	10%
Hypoglycemia	08	6%
Electrolyte imbalance	06	5%
Dehydration with Shock	05	04%
Outcome		
Discharge	120	93%
Default	08	06%
Death	01	0.07%
Expected Weight gain 15% of baseline	93	78.1%
3 follow up visits done	74	57.36%