

# Nutritional Rehabilitation of Children <6 mo with Severe Acute Malnutrition

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**Abstract** The authors studied the outcome of 108 infants <6 mo with severe acute malnutrition (SAM) admitted in the Nutritional Rehabilitation Centres (NRC) at a teaching hospital. The most common symptom that the children presented with, was acute diarrhoea (35.2 %) followed by failure to gain weight (26.9 %). Seventy five (69.4 %) infants were cured after nutritional rehabilitation and 29 (26.8 %) were non responders. Fifty two (48 %) infants showed good weight gain after proper counseling or supplementary suckling technique alone.

**Keywords** Breast feeding · Counseling · Positioning and attachment

## Introduction

Most of the studies on severe acute malnutrition (SAM) have been on children between 6 mo and 59 mo. The present study was conducted to study the outcome in infants <6 mo of age with SAM admitted in the Nutritional Rehabilitation Centres (NRC) of authors' hospital after nutritional rehabilitation in accordance to the guidelines issued by the Ministry of Health and Family Welfare (MOHFW), Government of India in collaboration with WHO [1].

## Material and Methods

The records of all the infants <6 mo admitted in the NRC over a period of 20 mo from January 2011 through August 2012

were collected and analysed. The study was approved by the Institutional Ethics and Research Committee. The criteria for admission of these children were i) Weight for Length (W/L) < -3 standard deviation (SD) (If length > 49 cm) or ii) Visible severe wasting or iii) Edema both feet. The infants were admitted, managed and discharged according to the set guidelines issued by the MOHFW. This was a UNICEF funded project in which a separate ward was established for children with SAM. Nurses, dieticians and the cooks were specially trained in identifying children with SAM and nutritional rehabilitation protocols.

Supplementary suckling technique (SST) was applied to mothers with lactation failure. This is a technique which can be used as a strategy to initiate re-lactation in mothers who have developed lactation failure or mother's milk insufficiency. Till the time breast feeding was fully established, the infants were started on non cereal based therapeutic diet, F100 D (Diluted Formula 100) feeds. The infant was weighed daily using a SECA digital weighing scale (precision 5 g) in the morning at a fixed time before feeds. When the child gained weight for five consecutive days at the centre and was free from any medical complications, he/she was fit for discharge. Non breast-fed infants were discharged on locally available animal milk with cup and spoon. The infants were called for four follow ups at two weekly intervals. The outcome indicators were: i) *Cured* Infants meeting the discharge criteria, ii) *Non responders* Infants not responding to the treatment and nutritional rehabilitation during hospital stay iii) *Relapse* A patient who has been discharged as cured from the hospital within the last 2 mo but is again eligible for admission and iv) *Death*.

## Results

A total of 431 children with SAM were admitted in the NRC during the period of 20 mo. Out of them 108 (25 %) children

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were <6 mo of age. The average weight gain of the infants during hospital stay was  $12 \pm 9.73$  g/kg/d. (Table 1) Forty seven (43.5 %) children were <2 mo, 43 (39.8 %) children were 2–4 mo and 18 (16.7 %) children were > 4 mo of age. The average weight gain during hospital stay in these age groups was  $15.9 \pm 10.7$ ,  $10.7 \pm 7.8$  and  $10.4 \pm 9.1$  g/kg/d respectively. This difference in weight gain was found to be significantly different ( $p=0.01$ ). 63.8 % infants <2 mo were successfully discharged on exclusive breast feeding with good weight gain against 46.5 % in age group of 2–4 mo and 56.2 % in infants > 4 mo.

Out of 108 infants 59 (54.6 %) babies were being breastfed at the time of admission, out of them only 2 were being exclusively breast fed. Forty nine (45.4 %) children were not being breastfed at all. Ninety babies (83.3 %) had one or more medical complications at admission and were transferred after stabilization from the emergency ward and only 18 (16.7 %) babies were directly admitted to the NRC.

The most common symptom that the children presented with, was acute diarrhea (35.2 %) followed by failure to gain weight (26.9 %). SST was used in 44 (40.7 %) babies. It was successful in 32 (72.7 %) babies and failed in 12 (27.3 %). The output indicators are given in Table 2.

## Discussion

According to NFHS III (2005–2006), in Uttar Pradesh 13.6 % of children <6 mo have their weight for height < -3 SD. Incidence of exclusive breast feeding fell from 74.5 % in babies <2 mo to 33.2 % in babies 4–6 mo [2]. Faulty feeding practices like prelacteal feeds, deprivation of colostrum and bottle feeding are amongst the most important risk factors for

**Table 1** Anthropometric measures in the infants with SAM

Parameter	Mean±SD
Age at admission	2.7±1.4 mo
Weight at admission	2630±823 g
Weight at discharge	2764±778 g
Average weight gain during hospital stay	12±9.73 g/kg/d
Length at admission	51.4±6.5 cm
Length at discharge	51.4±5.5 cm
W/L at admission	N (%)
< -4SD	67 (62)
< -3SD	28 (26)
< -2SD	13 (12)
Weight gain during hospital stay (g/kg/d)	
< 5 (poor weight gain)	22 (20.3)
5–10	21 (19.5)
>10 (good weight gain)	65 (60.2)

**Table 2** Outcome of infants <6 mo in NRC

Outcome	N (%)
Cured	75 (69.4)
Correction of positioning and attachment alone	20
SST	32
F-100 D	23
Death	3 (2.9)
Non responders	29 (26.8)
Relapse	1 (0.9)

severe malnutrition not only in children <6 mo but also older children 6–59 mo of age [3].

Vygen et al. studied infants <6 mo with SAM and found that diarrhea was the most common presenting complaint in these infants [4]. This is consistent with work done by other authors [5, 6]. Diarrhea and malnutrition lead to a vicious cycle, both worsening each other [7]. Diarrhea has been shown to predict poor outcome in children with SAM [8]. Withholding intravenous fluids and early initiation of feeds is the key to the management of children with SAM and diarrhea [9].

The daily weight gain chart was a good motivating factor which even the illiterate mothers were able to understand. The authors were able to achieve good weight gain in almost half of the babies on breast feeding alone after counseling. 26.8 % infants were non responders, the main reason being that the parents were not willing to stay in the hospital for sufficient time for nutritional rehabilitation to show the response.

The limitation of the study is that the authors were not able to achieve a good follow up, therefore they have not been able to observe, how these infants fared after discharge. A follow up in the community over a period of at least 1 year would be very useful.

Although most of the mothers are aware that breast milk is the best for their babies but they are unable to cope up with the challenges of exclusive breast feeding like the misconception of producing insufficient breast milk, problems of attachment and positioning *etc.* The health personnels themselves should not only be motivated but also trained regarding the breast feeding techniques and its problems.

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**Contributions** DKS and RR: Collection of data, analysis and writing the manuscript; PCM: Data analysis and editing the manuscript; MM and AS: Critical evaluation and editing the manuscript. DKS will act as guarantor for this paper.

**Conflict of Interest** None.

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