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**Original Research Article**

# Profile of severe acute malnutrition children admitted at nutritional rehabilitation centre at tertiary care treatment centre of Gujarat

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## ABSTRACT

**Background:** Severe acute malnutrition (SAM) may be major obstacle for India to achieve targeted Infant Mortality Rate and under five mortality rate. Malnutrition and infection form vicious cycle and contributes towards mortality. So, malnutrition prevention is major objective of government. Study of malnourished children helps to know aetiology and their response to treatment. The objective of study is to understand clinic-demographic profile of SAM children.
**Methods:** It is retrospective secondary data analysis study. For the purpose of this analysis, we retrieved the data of all children with SAM admitted from 1 January, 2018 to 31 December, 2018 to NRC. At the NRC, a physician conducted a clinical examination in children to detect the presence/absence of medical complications during their admission and these data were available in case sheet.
**Results:** A total of 162 children, aged 6-59 months were referred to the NRC. Around fourty seven percentage of children were in age group 6–12 months Majority of children were in age group of 7 months to one year of age. Majority of children were admitted based on weight of height criteria (Z score < 3SD). Mean admission weight is lower in female compare to male children.
**Conclusions:** Faulty weaning practises and delay in weaning in some cases predisposes later half of infancy period to undernutrition. So, proper health education and good IYCF practices prevent children from undernutrition.

**Keywords:** Health profile, NRC, Severe acute malnutrition

## INTRODUCTION

India is committed to achieve Sustainable Developmental Goal (SDG) and we can observe the committed political affords to achieve to it. One of the target of third sustainable development goal is to achieve neonatal mortality rate to less than 12 per 1000 live birth and under 5 mortality rate to low as 25 per 1000 live birth by 2030. Severe acute malnutrition has been a real obstacle to the achievement of the third Sustainable Developmental Goal (SDG) as malnutrition directly and indirectly effect the survival of children under five year of age severe acute malnutrition is a major public health issue, which affects 7.5% of under-five children in India according to NFHS-4 survey.[1] Nearly 0.6 million deaths and 24.6 million DALYs (disability adjusted life years) are attributed to this condition.[2] Short-term consequences of malnutrition include mortality and morbidity, for example, pneumonia, diarrhoea, fatigue and impaired thermos-regulation. In the long term, malnutrition in children may affect adult size, intellectual ability, economic productivity and reproductive performance, and increase the risk of metabolic disorders and cardiovascular disease.[3] Nutritional anaemia is also more common among Sever acute malnutrition (SAM) children and it is also contributing factor for infections.[4,5] The facility based care is being implemented through a network of CMTCs and NRCs. The admission criteria is

W/H less than –3Z score or MUAC <115mm, or bilateral pedal oedema. The appetite test for all children is undertaken. The children are admitted for 14-21 days. They are given locally made F-75 and F-100. The children are discharged after regaining good appetite and body weight. After the discharge, registration of child to ICDS scheme is undertaken and follow up of Children is done through home visit.

The objective of the analysis presented here is to assess the effectiveness of NRCs in providing therapeutic care for children with SAM and to inform the effective management of it in centre.

## METHODS

For the purpose of this analysis, we retrieved the data of all children with SAM admitted from 1 January, 2018 to 31 December, 2018 to NRC. The detection of children with SAM was ensured in the villages by the community workers of the Integrated Child Development Services (ICDS) program either as part of monthly growth monitoring and promotion sessions at the ICDS centre (passive case finding) or in the context of community drives for the identification of children with SAM (active case finding). At the NRC, a physician conducted a clinical examination in children to detect the presence/absence of medical complications (altered alertness, respiratory tract infections, diarrhoea/severe dehydration, high fever/ malaria, tuberculosis, and/or severe anaemia) using the criteria for the Integrated Management of Neonatal and Childhood Illnesses (IMNCI).[6] Children with medical complications, and/or bilateral pitting edema, and/or with poor appetite were fed a locally-prepared therapeutic formula meant as a substitute for F-75 (herewith referred to as F75-proxy) to provide 100 kcal/kg/day. Primary outcome variables were mean rate of weight gain (gm/kg/day), proportion of children achieving target weight and recovery from SAM status. The mean rate of weight gain (g/kg/day) was calculated as weight gain over a defined time period divided by the number of days.

## RESULTS

**Table 1: Age distribution of SAM children.**

| Age group (in months) | Female, n=88 (%) | Male, n=74 (%) | Total, n=162 (%) |
|---|---|---|---|
| **< 12** | 40 (45.45) | 37 (50) | 77 (47.53) |
| **12-24** | 30 (34.09) | 27 (36.49) | 57 (35.19) |
| **24-36** | 14 (15.91) | 7 (9.46) | 21 (12.96) |
| **36-48** | 4 (4.55) | 2 (2.70) | 6 (3.70) |
| **48-60** | 0 | 1 (1.35) | 1 (0.62) |

A total of 162 children, aged 6 - 59 months were referred to the NRC. Around forty seven percentage of children were in age group 6 – 12 months (Table 1). Mean age of presentation was 16.2 months.

Of the 162 children with severe wasting 139 children (85.80%) had a weight-for height/ length z-score (WHZ) below -3 SD, 21 (12.96) children (80.7%) had a MUAC <115 mm. (Table 2) children with below _3SD is more among male compare to female (Figure 1).

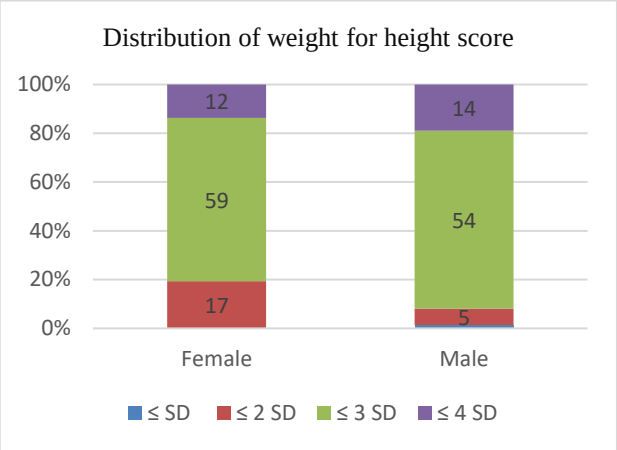


**Figure 1: Sex wise distribution of weight for height score.**

**Table 2: Distribution of positive diagnostic criteria for SAM children.**

| Criteria | Frequency (%) |
|---|---|
| **Weight for Height Z score < 3 SD** | 139 |
| **MUAC < 11.5** | 21 |
| **Bilateral pedal oedema** | 3 |

Seventy-three percentage of SAM children had one or other co morbid condition on admission. Anaemia is most common co morbidity and it is present in 67.9% of SAM children. Others common conditions were bronchiolitis tuberculosis and pneumonia (1.23%) (Table 3).

**Table 3: Frequency of comorbid condition in SAM (n=118).**

| Other co morbid condition | Number | Percentage |
|---|---|---|
| **Anaemia** | 110 | 67.90 |
| **Bronchiolitis** | 2 | 1.23 |
| **Tuberculosis** | 2 | 1.23 |
| **Pneumonia** | 2 | 1.23 |
| **Intussusception** | 1 | 0.62 |
| **Thymus +** | 1 | 0.62 |

Mean weight on NRC admission is low low in female compare to male children but this difference is not statistically significant. Mean weight gain and mean weight gain percentage is high in female compare to male admissions, though this difference is statistically not significant (Table 4).

**Table 4: Effect of gender on weight gain at NRC**

| | Mean | SD | P value |
|---|---|---|---|
| **Weight of admission** | | | |
| Female | 6.0630 | 1.5035 | 0.34 |
| Male | 6.2993 | 1.6673 | |
| **Mean percentage of weight gain** | | | |
| Female | 6.8063 | 6.1049 | 0.36 |
| Male | 5.8828 | 6.6929 | |
| **Weight gain in grams** | | | |
| Female | 387.7 | 36.20 | 0.4 |
| Male | 368.5 | 44.64 | |

## DISCUSSION

Mean age of children reporting with malnutrition was similar to other studies and there was no significant sex predominance in malnourished children.[7] Most common effected age group is six to twelve months. Common affected children in this group may be due to faulty weaning practices.

The program achieved survival outcomes that comparable with national and international standards of care (<10% child deaths).[8,9] This is important as the primary objective of NRCs is to reduce fatality rates among children with SAM. More than half (54.6%) of the children admitted to the NRCs had uncomplicated SAM (no edema and/or medical complications). International guidelines recommend that children with uncomplicated SAM be cared for through a community-based program for the management of SAM as these children are at a significantly lower risk of death than children with complicated SAM and can be cared for at home.[10]

Overlapping nature of protein–energy malnutrition and micronutrient deficiencies were well understood and it is seen that lack of one micronutrient is typically associated with deficiency of others.[10]Anaemia was most common micronutrient deficiencies associated with malnutrition in our study, and this is consistent with the previous reports.[9] The high incidence of anaemia in these children could be due to nutritional factors as well as incidental helminthic infections.

Less than fifty percent children discharged gained at least 15% of their initial weight, the minimum weight gain recommended by WHO and India's Ministry of Health to discharge children as recovered.[8,9]

Average weight gain is 6.4% of their initial weight at this NRC centre. This may be because of different admission criteria and quality of care different centre.

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