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

Nisha Prajapati, Seema Shah*

Department of Pediatrics, GMERS Medical College, Gandhinagar, Gujarat, India

Received: 08 July 2020
Accepted: 10 August 2020

*Correspondence:
Dr. Seema Shah,
E-mail: priyankasuketu@yahoo.in

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

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 forty 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 Severe 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

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20203650
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). 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 morbidity 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 compared to male children but this difference is not statistically significant. Mean weight gain and mean weight gain percentage is high in female compared 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. Most common affected 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). 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.

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. Anaemia was most common micronutrient deficiencies associated with malnutrition in our study, and this is consistent with the previous reports. 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.

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.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. International Institute for Population Sciences (IIPS). Factsheet: National Family Health Survey, NFHS-4, 2017. Available at: http://rchiips.org/ NFHS/factsheet_NFHS-4.shtml Assessed 01 June 2018.
2. Black RE, Allen LH, Bhutta ZA, De Onis M, Ezzati M, Mathers C, et al. Maternal and Child under nutrition: global and regional exposures and health consequences. Lancet. 2008;371:243-60.
3. Black RE, Allen LH, Bhutta ZA, Caulfield LE, De Onis M, Ezzati M, et al. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet 2008;371(9608):243-60.
4. Lukens JN. Iron metabolism and iron deficiency. In: Miller BD, Bodner RL, Miller LP, eds. Blood diseases of infancy and childhood. Philadelphia: Mosby. 1995:193-219.
5. Warrier RP. The anaemia of malnutrition. In: Suskind RM, Suskind LL, eds. The malnourished child. New York:Lippincott-Raven. 1990:19:61-72.
6. World Health Organization. Technical updates Evidence and recommendations for future adaptations 2005 Available at https://www.who. int/maternal_child_adolescent/documents/92415934 82/en/ Assessed on 01 June 2018.
7. Bachou H, Tyleskär T, Deogratias H, Mulindwa K, Tumwine JK. Bacteraemia among severely malnourished children infected and uninfected with the Human immunodeficiency virus-1 in Kampala, Uganda. BMC Infect Dis. 2006;6:160.
8. Chainani N, Sharma P, Meena N, Sharma U. Pattern of vitamin deficiencies among the malnourished preschool children in ICDS blocks of Jaipur city. Indian J Matern Child Health. 1994;5:109-11.
9. Ejaz MS, Latif N. Stunting and micronutrient deficiencies in malnourished children. J Pak Med Assoc. 2010;60:543-7.
10. Müller O, Krawinkel M. Malnutrition and health in developing countries CMAJ. 2005;173:279-86.

Cite this article as: Prajapati N, Shah S. Profile of severe acute malnutrition children admitted at nutritional rehabilitation centre at tertiary care treatment centre of Gujarat. Int J Contemp Pediatr 2020;7:1894-6.