International Journal of Contemporary Pediatrics
Dhanalakshmi K et al. Int J Contemp Pediatr. 2017 May;4(3):801-803
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20171490

Original Research Article

The outcome of severe acute malnutrition children admitted to nutrition rehabilitation centre of a tertiary level care hospital

Dhanalakshmi K.*, Gayathri Devi C.

Department of Paediatrics, Bangalore Medical College and Research Institute, Bengaluru, Karnataka, India

Received: 19 March 2017
Accepted: 28 March 2017

***Correspondence:**
Dr. Dhanalakshmi K.,
E-mail: dhanalakshmi.kumble@gmail.com

ABSTRACT

Background: Malnutrition is common in paediatric age group and is responsible for high morbidity, mortality and serious long term sequelae. A nutritional therapy followed by nutritional rehabilitation is a very important aspect for these children. Optimal management of these acutely ill children and a good outcome depends on an evidence based regimen of care in the Nutritional Rehabilitation Centre (NRC). We under took this study to know the outcome of SAM children admitted to the NRC of our hospital.
Methods: 736 children were enrolled in the study. Data of the children like age, sex, criteria for admission, associated complications, feeding pattern, response to therapy and their outcome were evaluated.
Results: female were 371 (50.40%) and male were 365(49.5%) children. 221 (30.02%) were <6months, 231(31.38%) 6-12months, 144 (19.56%) 12months-24months and 140(19.02%) were >2 years. The weight for height of all the children were less than -3SD. 72.9% of the children had complication, diarrhoea in 28.49% and pneumonia in 35.75% were the common complications. 513 (74.55%) children showed some weight gain. The mean weight gain was 4.4 gm/kg/day. Mean duration of stay was 8.45 days. Cure rate was 81% and death rate was 6.52%.
Conclusions: With a cure rate of 81%, death rate of 6.52% and defaulter rate of 12.09%, falling within the acceptable range and duration of stay 8.4 days, weight gain of 4.4g/kg/days in the lower range, management of these children in specialised feeding centre is important for faster recovery and a better weight gain.

Keywords: NRC, Outcome, Severe acute malnutrition

INTRODUCTION

Malnutrition is common in paediatric age group and is responsible for high morbidity, mortality and serious long term sequelae. The prevalence of Severe Acute Malnutrition (SAM) in under 5 children is said to be about 6.4%.[1] A phase wise implementation of Nutritional Rehabilitation Centres (NRCs) has been introduced in India to manage children with SAM. NRCs also help mothers to improve the overall well-being of the child. NRCs treat these children with medical complications; help them with the dietary therapy and advice. The diets F75 and F100 help in the early recovery in these children. The introduction of NRCs has brought uniformity in the management of SAM children.[1] SAM children are faced with many complications, like pneumonia, diarrhoea, and sepsis. Recovery of may vary in these children. Recovery rate may also vary in different NRCs.[2-4] Hence, this study was undertaken to know the outcome of SAM children admitted to the NRC of our hospital.

METHODS

This is a retrospective hospital based study of medical data of SAM children admitted to NRC from Jan 2014to Dec 2015, at Vani Vilas children's Hospital, attached to Bangalore Medical College and Research Institute, Bangalore, Karnataka. The hospital has a 20 bedded

NRC. 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 oedema of both feet. The criteria to identify SAM in infants less than 6 months of age are, oedema of both feet and / or weight-for- length less than -3SD (in infants with length more than 45 cms) and /or visible severe wasting in infants with length less than 45 cms.[1]

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. Very sick children were initially managed in the PICU and once stabilised were shifted to the NRC. 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.

RESULTS

736 children were fulfilling the criteria for admission to NRC during the study period. Weight for height of all these children were below -3SD. Only 6 children had pedal edema.

There were 221 (30.02%) of children belonging to the age group of <6 months and 231 (311.38%) above 6 months. Children between 12 months-24 months were 144 (19.56%) and between 25 months to 60 months were 140 (19.02%). Total numbers of female children were 365 (49.5%) and male children were 371 (50.4%). Majority of the children below the age of 6 months were on mixed feeds 201 (91%). Immunization coverage was up to date in 655 (89%) of the cases. Majority of the children, 537 (72.9%), had associated complication, as shown in Table 1.

The mean duration of stay at NRC was 8.45days. 273 (39.6%) children stayed for <7days, 342 (49.7%) children stayed for 7-14days and 73 (6.1%) children stayed for >14ays but <4weeks. None of the children stayed for more than 4weeks.

Table 1: Distribution of complications.

Complications	n = 537 (%)
Pneumonia	153 (28.49)
Acute GE	192 (35.75)
Sepsis	69 (12.84)
Congenital heart disease	45 (8.37)
Congenital renal anomalies	08 (1.48)
Measles	08 (1.48)
Tuberculosis	07 (1.3)
Down's syndrome	01 (0.18)
Nutritional anaemia	35 (6.5)
Developmental delay	13 (2.47)
SAM with oedema	06 (1.11)
Total	**537 (100)**

Table 2: Distribution in relation to death.

Age distribution (months)	Males No. (%)	Females No. (%)	Total No. (%)
1-6	18 (37.50)	10 (20.83)	28 (58.33)
7-12	04 (08.33)	07 (14.58)	11 (22.91)
13-24	02 (04.16)	02 (04.16)	04 (08.33)
25-60	02 (04.16)	03 (06.25)	05 (10.41)
Total	**26 (54.16)**	**22 (45.83)**	**48 (99.99)**

513 (74.55%) of the children showed some weight gain during the hospital stay, that is, minimal weight gain of 5gm/kg/day for 3 successive days was observed in 428 (62.2%) of the children and target weight at 15% weight gain was seen in 85 (12.35%) children. 175 (25.43%) children did not show any weight gain during the hospital stay. The mean weight gain was 4.4gms/kg/day. SAM children with oedema started losing weight after 4 days of therapy, without any complication.

Table 3: Cause of death.

Cause of death	Number (%)
Sepsis	11 (22.91)
Pneumonia	11 (22.91)
Gastroenteritis with sepsis	11 (22.91)
Congenital heart disease in failure	09 (18.75)
Anaemia	04 (08.33)
Tubercular meningitis	01 (02.08)
Acute bacterial meningitis	01 (02.08)
Total	**48 (100)**

Of the 688 children discharged from the NRC, 599, children were considered cured, that is, either free of complications or showing adequate weight gain and the recovery rate was 81%. There were 89 (12.93%) defaulters. 08 children got readmitted to the NRC. Three cases of congenital renal anomalies were transferred to Paediatric Surgery department. Total deaths in the NRC were 48, death rate being 6.97%. Maximum deaths, 28 (58.33%) occurred in the age group of 1m-6m.

Pneumonia, Sepsis and Gastroenteritis with sepsis were the common causes of death.

The quantitative indicators of the NRC were as follows. The recovery rate was 81%, the death rate was 6.52%, the defaulter rate was 12.09%, mean weight gain was 4.4g/kg/day and the mean duration of stay was 8.45 days.

DISCUSSION

NRC is one 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, 6.5% in our study when compared to 20.1% in other studies.[6] Our NRC achieved good outcome with respect to recovery rate of 81%, Death rate of <10%, defaulter rate of <15%, which is acceptable according to the WHO protocol.

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] Major problems faced in NRCs was the duration of stay and also the mean weight gain which was low in our study when compared to other studies-14gm/kg/day, since most of the patients were opting for early discharge when once the complications were under control.[8] The defaulter rate was better in our study, 12.09%, 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]

ACKNOWLEDGEMENTS

Authors thank all the patients and their parents/guardians, who participated in the study. Our humble thanks to the HOD and colleagues for their suggestions, which greatly helped in carrying out this study.

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

REFERENCES

1. Ministry of Health and Family Welfare Government of India, Operational guideline: facility based management of SAM children, Module. 2011:4-6. Available from: http://www.rajswasthya.nic.in/MTC%20Guideline-%20MOHFW.pdf
2. Bharathi S, Anuradha K, Rao JV. An experience at a tertiary level hospital NRC in management of severe acute malnutrition in children aged between 6-59 months adopting World Health Organization recommendations. Res Health Sci. 2016;1(1):41-50.
3. Saaka M, Osman SM, Amponsem A, Ziem JB, Abdul-Mumin A, Akanbong P et al. Treatment outcome of severe acute malnutrition cases at the tamale teaching hospital. J Nutrition Metabol. 2015;2015:1-8.
4. Singh K, Badgaiyan N, Ranjan A, Dixit HO, Kaushik A, Kushwaha KP et al. Management of children with severe acute malnutrition: experience of nutritional rehabilitation centres in Uttar Pradesh, India. Indian Pediatr. 2014;51:21-5.
5. Hossain MI, Dodd NS, Ahmed T, Miah GM, Jamil KM, Nahar B et al. Experience in managing severe acute malnutrition in a government tertiary treatment facility in Bangladesh. J Health Popul Nutr. 2009;27(1):72-9.
6. Mathur A, Tahilramani G, Yadav D, Devgan V. Experience in managing children with severe acute malnutrition in nutrition rehabilitation centre of tertiary level facility, Delhi, India. Int J Contemp Pediatr. 2016;3(2):597-600.
7. Maurya M, Singh DK, Rai R, Mishra PC, Srivastava A. An experience of facility based management of severe acute malnutrition in children aged 6-59 months adopting the World Health Organization recommendations. Indian Pediatr. 2014;51:481-3.
8. Teferi E, Lera M, Sita S, Bogale Z, Datiko DG, Yassin MA. Treatment outcome of children with severe acute malnutrition admitted to therapeutic feeding centres in Southern Region of Ethiopia. Ethiopia J Health Develop. 2014;24:234-8.
9. Nagar RP, Nagar T, Gupta BD. Treatment outcome in patients with severe acute malnutrition managed with protocolised care at malnutrition treatment corner in Rajasthan, India: a prospective observational study (quasi-experimental). Int J Res Medical Sci. 2016;4(1):238-45.

Cite this article as: Dhanalakshmi K., Devi CG. The outcome of severe acute malnutrition children admitted to Nutrition Rehabilitation Centre of a tertiary level care hospital. Int J Contemp Pediatr 2017;4:801-3.