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Research Article

OUTCOME OF MANAGEMENT OF SEVERE ACUTE MALNUTRITION CASES ADMITTED AT NUTRITIONAL REHABILITATION CENTER: A PROSPECTIVE OBSERVATIONAL STUDY FROM A TEACHING HOSPITAL FROM SOUTH EASTERN RAJASTHAN

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ABSTRACT

Objective: This study was aimed to evaluate the effect of nutritional interventional measures on nutritional status of SAM children admitted in NRC in terms of increment in basic defining criteria of SAM.

Methods: 54 cases were included in the study. Baseline variables such as age and sex duration of stay; general physical examinations including status of edema and systemic examination were conducted, and the clinical signs of micronutrient deficiencies were assessed. Anthropometric parameters such as weight, height/length, and mid-upper arm circumference were recorded at admission and discharge.

Results: The mean weight of children at admission and discharge was 5.88±1.59 kg and 6.71±1.77 kg, respectively. Average weight gain was 0.84±0.42 kg (t = −0.784, p=0.437). An average rate of weight gain was 11.22±5.43 gm/kg/day. The Mean MUAC at admission was 10.62±1.21 cm, and mean MUAC on discharge was 11.49±1.24 cm. After intervention in hospital, about 65% of patients had <−2 Standard deviation (SD) of weight for height.

Conclusion: We concluded that NRCs are effective in the management of malnutrition.

Keywords: Severe Acute Malnutrition, Nutritional rehabilitation center, Management.

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INTRODUCTION

According to the United Nations Children's Fund, malnutrition accounts for 45% of all under-five deaths, with India and Nigeria accounting for more than one-third of these deaths [1].

The WHO's definition of severe acute malnutrition is as follows: mid-upper arm circumference (MUAC) of less than 11.5 cm in children between 6 and 60 months of age; weight-for-height Z scores of <−3 SD or less than 70% of the reference median; clinical criteria (presence of "visible severe wasting" or "bipedal edoema") [2].

According to the WHO Child Growth Standards, 7.9% of children in India had severe wasting, according to the third National Family Health Survey [3].

The WHO and Indian Academy of Pediatrics have established guidelines for the management of SAM. A uniform protocol is used at Nutrition Rehabilitation Centers to control SAM based on the aforementioned recommendations (NRCs) [4,5].

It is crucial to get access to these nutritional rehabilitation clinics' therapeutic results of dietary interventional measures. The goal of this study was to determine how nutritional interventional methods affected the nutritional condition of SAM children admitted to the NRC in terms of an increase in the fundamental SAM defining criteria.

METHODS

From November 2012 to October 2013, this prospective observational study was conducted at the pediatrics department's NRC at a tertiary care teaching hospital in Rajasthan. Children aged 6–60 months who were admitted with severe acute malnutrition according to the WHO criteria were included in this study [4]. Children with systemic illness-related chronic malnutrition who were unwilling to participate in the study and who departed against medical advice were not included in it. The study included a total of 57 patients who had been admitted during this time period and met the following inclusion criteria. A total of 54 instances were included in the study because three of them left against medical recommendation.

Before the study began, the departmental ethics committee granted its ethical clearance. Parents provided signed, fully informed consent. Every participant was offered the chance to leave the research at any moment, while they were in the hospital.

In a pre-designed pro forma, baseline data such as age, sex, and length of hospital stay as well as a thorough history covering dietary history, breastfeeding status, family history, and socioeconomic position were documented. The status of edema and a systemic examination were performed, and the clinical indicators of micronutrient deficiencies were evaluated. Upon admission and discharge, anthropometric measurements such as weight, height, and mid-upper arm circumference were taken. Height, length, and mid-upper arm circumference were measured using a digital weighing scale, stadiometer, and infantometer, respectively.

The data were entered in MS Excel spreadsheet, and analysis was done using SPSS version 20.0. All variables were tabulated, analyzed statistically and simple proportions were calculated. Weight, MUAC, and weight for height at admission and discharge were compared for the study. Paired Student t-test was applied and $p<0.05$ was considered statistically significant.

RESULTS

Out of 54 SAM children (n=54), Male: Female ratio was 1:1. Out of which, 28 (51.9%) of patients were in the age group of 6–12 months

and 26 (48.1%) were between 12 and 60 months of age group. The mean age of presentation was 16.81 months. 28 patients were on breastfeeding along with complementary feeding and rests were not on breastfeeding at admission. Comorbidity associated with malnourished children admitted in our hospital was diarrhea (25), anemia (27), vomiting (19), and ARTI (17). All malnourished children were initially managed with broad-spectrum antibiotics in the combination of a third-generation cephalosporin with an aminoglycoside (Table 1).

The mean duration of stay in hospital in male, female, and overall were 13.04±02.47 days, 13.93±3.01 days, and 13.48±3.01 days, respectively. Edematous patients (Number=8) started losing edema at mean 3.5±3.3 days. Non-edematous patients (Number=46) started gaining weight at mean (SD) 4.7±3.8 days, and edematous patients started doing so at 10.3±6 days.

The mean weight of children at admission was 5.88±1.59 kg and mean weight on discharge was 6.71±1.77 kg. This was statistically significant (t=−14.55, p<0.001). Average weight gain in male, female, and overall was 0.88±0.31 kg, 0.79±0.51 kg, and 0.84±0.42 kg, respectively (t=−0.784, p=0.437). An average rate of weight gain was 11.22±5.43 g/kg/day.

The Mean MUAC at admission was 10.62±1.21 cm, and mean MUAC on discharge was 11.49±1.24 cm. This was statistically significant (t=−13.87, p<0.001) (Fig. 1).

At the time of admission, weight for height was of <−3 SD in 20 Cases and <−4 SD34 Cases. After intervention in hospital, about 65% of patients improved their health status and entered into <−2 SD of weight for height. Weight for height of 22 children was in −2 SD to −1 SD group and 13 were in <−1 SD group at discharge. About 35% (19) of children had less than −3 SD of weight for height at discharge.

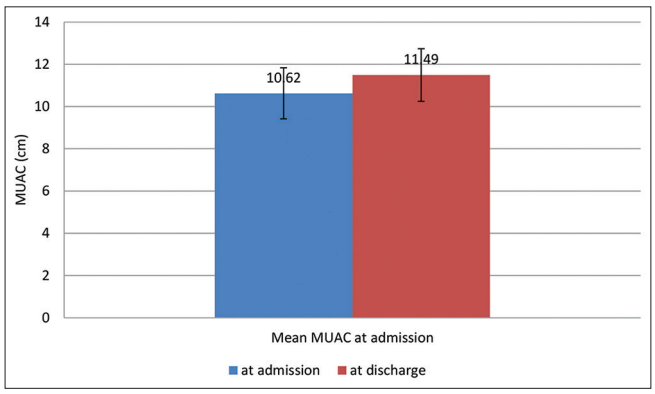

Fig. 1: Change in MUAC from admission to discharge

Table 1: Demographic and clinical profile of SAM study subjects

Variable	No. (%)/Mean
Male:Female	27:27
Age group	
6–12 months	28 (51.9)
12–60 months	26 (48.1)
Comorbidity	
Diarrhea	25 (46.3)
Anemia	27 (50)
Vomiting	19 (35.2)
ARTI	17 (31.5)
Mean weight of children at admission	5.88±1.59 kg
Mean MUAC at admission	10.62±1.21 cm
Weight for height	
<−3 SD	20 (37)
<−4 SD	34 (63)

SD: Standard deviation

DISCUSSION

Only by closely following the WHO management protocols in NRCs with qualified staff and sufficient resources to create the F-75 and F-100 food formulas for rehabilitation may case fatality rates in SAM patients be reduced to fewer than 10% [6]. The WHO suggests using whole dried milk, skimmed milk powder, fresh cow milk, and cereal flour (if cereal-based) when creating these feeding formulas, in addition to vitamin and mineral solutions.

The average daily rate of weight growth in this study was 11.225.43 g/kg. The average hospital stay was 13.48 3.01 days. Similar to this, our study's mean MUAC and weight for height both increased.

The children's average weight growth, while in the NRC compares favorably with the minimum average weight gain (8 g/kg body weight/day) for programs that treat SAM-affected kids at the national and international levels [7,8]. Children's average weight increase was 96 (SD 84) g/kg body weight per day, according to a study by Aguayo VM *et al.* from Jharkhand malnutrition treatment clinics, and their average length of stay was 160 (SD 57) days [9].

According to research of 170 patients in Ethiopia, the rate of weight increase was substantially lower than the minimal international norms [10]. Similar parallels have been noted in reports from Kenya, Bangladesh, and Pakistan [11].

With a focus on detecting and referring undernourished children from villages to higher centers, the NRC has formed as a quasi-vertical approach. The goal of the NRCs is to bring community-based professionals from the health department and the department of women and child development together to coordinate and link referrals for SAM children. The majority of the literature on the subject reports that restricting conditions at home and inside the center itself have an impact on the long-term success of the NRC. A significant number of the admitted children come from underprivileged population groups [12].

Therefore, one-time intervention of children at NRCs may not be a sustainable strategy and need to be reinforced by regular follow-up visits by the community-based workers. Thus, it is critical to establish an interdepartmental mechanism for better coordination and integration at the grass root level.

The limitations of the study was that it was a single centric and conducted at a tertiary care teaching hospital with trained pediatrics residents and nurses available round the clock. The results would be difficult to extrapolate in the community setting at the primary care level and secondary (referral) level. The exclusion of LAMA patients from the study might also increase the positive results.

CONCLUSION

We found the significant gain in the MUAC, mean weight, and weight for height of the study group at the time of discharge reflects a positive effect of the interventional measures on the admitted children in NRC. We concluded that NRCs are effective in the management of malnutrition and related complications.

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AUTHORS' CONTRIBUTIONS

All the authors have contributed equally.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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