Research Article

Evaluation of the effects of nutrition intervention measures on admitted children in nutritional rehabilitation center, Gulbarga, India

Gulrukh Hashmi*, S. Sathish Kumar

Department of Community Medicine, Vinayaka Missions Medical College and Hospital, Karaikal, Puducherry UT, India

*Correspondence:
Dr. Gulrukh Hashmi,
E-mail: hashmi.gulrukh@gmail.com

ABSTRACT

Background: Children with severe acute malnutrition require immediate attention along with proper nutritional rehabilitation for which nutritional rehabilitation centers (NRC) has been established. Even with establishment of NRCs the proportion of severe acute malnutrition in community has not been reduced. Thus it is necessary to know the effect of nutritional interventions on children admitted to these centers. Present study was done to analyze the effect of nutritional interventions on the children admitted to nutritional rehabilitation centre by reviewing the anthropometric indicators.

Methods: A longitudinal observational study was done among the children admitted to NRC from January 2013 to June 2014. A predesigned and pre-tested proforma was used to collect the socio demographic information. Admitted children were observed to analyze the effects of interventional measures on select anthropometric indicators. The data collected was entered in Microsoft excel sheet and analyzed.

Results: Majority of the admitted children (41.77%) was in 12-23 months age group. 88(51.76%) were females and 82(48.24%) were males. Overall mean weight at admission was 7.19±1.57 kgs; for males it was 7.23±1.54 kgs and for females it was 7.16±1.60 kgs. The overall mean weight at discharge is 7.94±1.77 kgs for males it was 8.01±1.82 kgs and for females it was 7.88±1.72 kgs. The average weight gain for the study group during their stay at the centre was 7.9±1.6 g/kg/day. The target weight was achieved only by 26% of admitted children.

Conclusions: Nutritional rehabilitation centers are effective in management of severe malnutrition. However improvements are necessary to ensure the full recovery of all children admitted.

Keywords: Severe acute malnutrition, Nutrition rehabilitation centre, Anthropometric indicators

INTRODUCTION

Nutrition is one of the most important factor affecting the growth and development of children and nutritional status is the best global indicator of well-being in children. However, even after a decade of galloping economic growth, India is facing the problem of malnutrition among fewer than five children. Malnutrition weakens immune response and aggravates the effects of infection and so, children who are malnourished tend to have more severe diarrheal episodes and are at a higher risk of pneumonia trapping the children in a vicious cycle of malnutrition.[1] Globally, 162 million under-five year children were stunted in 2012, of which 56 percent of all stunted children lived in Asia and 36% in Africa.

99 million under-five children were underweight of which 67% lived in Asia and 29% in Africa.[2] In India, 42.5% under five children are underweight, 48 % are stunted and 19.8 % are wasted.[3]

Roughly 8 million or 6.4% can be assumed to be suffering from Severe Acute Malnutrition (SAM). In Karnataka, 35% are underweight, 36.2% of children under age five are stunted, 26% are wasted, 10.5% are severely wasted.[4] WHO and UNICEF has recommended community (both in emergency and nonemergency settings) and facility-based options for management of SAM. Similar recommendations are made by Indian Academy of Pediatricians but facility based management has emerged as a state promoted and dominant model in India.[5]

Following the guidelines of WHO and in response to the state of malnutrition in India, nutrition rehabilitation centres were established in state of Madhya Pradesh where severely acute malnourished children can be admitted and receive treatment. At these centers nutritional and medical interventions that include appropriate antibiotics, deworming tablets, iron supplementation and micronutrients are provided to the children. Supervised feeding of therapeutic diets (F-75, F-100) is given and medical intervention is provided by doctor in charge and nurses at the centre.

The children are discharged after a minimum period of 14 days, provided the child does not show any obvious signs of infection or edema, has received stipulated amount of micronutrients, is gaining atleast 8-10 g/kg/day. The child is again brought to the centre on designated follow up dates at 15 days, 1months, 3 months and 6 months following discharge from the NRC. The anthropometric measurements are taken on the follow up visits and the child is treated for medical conditions and readmitted if needed.[6] The National Rural Health Mission (NRHM), Ministry of Health and Family Welfare facilitated the states in setting up the NRCs at various district hospitals.

In Karnataka despite 28 NRCs, the percentage of severely malnourished children has increased from 6% to 11%.[4] Thus it is necessary to analyze the effects of NRCs in improving the health and nutritional status of children. Present study is carried out to assess the effects of nutritional interventional measures on the children admitted to nutritional rehabilitation centre, Gulbarga.

METHODS

The present study was carried out at Nutritional Rehabilitation Centre, General Hospital, Gulbarga, Karnataka, India. Children between 6-60 months of age group admitted to the NRC between 1st January 2013 to 31st December 2013 whose parents gave consent were included in the study. Children with chronic diseases like congenital heart diseases, HIV, cerebral palsy, chronic renal diseases etc. were excluded

 A detailed data of the patients including name, age, sex, caste, address, religion, anthropometric and outcome indicators were taken over the predesigned performa. Weight at the time of admission and discharge and daily

weights were recorded from the NRC registers. Average weight gain was calculated to see if it was in accordance with the available guidelines.[6] The data was analyzed using SPSS version 21 and expressed in frequency, percentages and proportions. The difference between mean and standard deviation between weights at admission and discharge was calculated using paired t test. The statistical significance was evaluated at 5% level of significance.

RESULTS

The present study included 170 children admitted to NRC in Gulbarga. Majority (41.77%) of the children were in the age group of 12-23 months. The proportion of females (51.76%) among the admitted children was greater than males (48.24%). Socioeconomic stratification according to modified B G Prasad classification showed that majority of the children (56.47%) belonged to class V i.e. lower class (Table 1).

Table 1: Distribution of the study participants according to sociodemographic determinants.

Variables	Frequency (N=170)	Percentage
Age		
12-23	71	41.77
24-35	56	32.94
36-47	23	13.53
48-60	20	11.76
Gender		
Males	82	48.24
Females	88	51.76
Religion		
Hindus	54	31.76
Muslims	36	21.18
Christians	02	1.17
SC/ST	48	28.24
OBC	30	17.65
Socioeconomic status		
Class I	0	0
Class II	19	11.18
Class III	24	14.12
Class IV	31	18.23
Class V	96	56.47

Overall mean weight at admission was 7.19±1.57 kgs. For males, it was 7.23±1.54 kgs and for females, it was 7.16±1.60 kgs. The overall mean weight at discharge is 7.94±1.77 kgs. For males, it was 8.01±1.82 kgs and for females, it was 7.88±1.72 kgs. A statistically significant difference was found between mean weight at admission and mean weight at discharge for all children (t=4.133; p<0.001), for males it was t=2.96 p=0.003 and for females t= 2.842 p<0.005 (Table 2).

The mean MUAC at admission was 11.8±0.7 cm and at discharge was 12.13±0.7 cm. The difference was

observed to be statistically highly significant (t=12.54, p<0.001). The mean MUAC for the boys at admission was 11.7±0.8 cm and at discharge it was 12.06±0.7 cm

which was statistically highly significant (t=8.085, p<0.001).

Table 2: Comparison of mean weights of study participants at admission and discharge.

Age(months)	Mean weight at admission			Mean weight at discharge		
	Males(kg)	Females(kg)	Total	Males(kg)	Females(kg)	Total
12-23	6.78±0.87	6.28±0.71	6.49±0.83	7.43±0.96	6.94±0.74	7.15±0.88
24-35	7.05±1.26	7.06±0.64	7.05±1.02	7.77±1.40	7.76±0.72	7.77±1.14
36-47	7.45±1.59	7.29±1.11	7.38±1.40	8.23±1.70	8.08±1.36	8.17±1.57
48-60	9.3±2.44	10.2±1.76	9.84±2.11	10.84±2.96	11.09±1.98	10.10±2.42
Total	7.23±1.54	7.16±1.60	7.19±1.57	8.01±1.82	7.88±1.72	7.94±1.77

A statistically significant difference was found between mean weight at admission and mean weight at discharge for all children (t=4.133; p<0.001), for males it was t=2.96 p=0.003 and for females t= 2.842 p<0.005

Table 3: Comparison of MUAC of study participants at admission and discharge.

Age(months)	MUAC at admission			MUAC at discharge		
	Males(cm)	Females(cm)	Total	Males(cm)	Females(cm)	Total
12-23	11.7±0.7	11.7±0.7	11.7±0.7	12.08±0.6	12.07±0.6	12.07±0.6
24-35	11.6+0.8	11.8±0.8	11.7±0.8	11.9+0.8	12.28±0.8	12.08±0.8
36-47	11.9±0.5	11.0±0.6	11.9±0.5	12.2±0.3	12.05±0.5	12.12±0.4
48-60	12.2±0.8	12.32±0.5	12.3±0.6	12.4±1	12.54±0.7	12.50±0.8
Total	11.7±0.8	11.8±0.7	11.8±0.7	12.06±0.7	12.20±0.7	12.13±0.7

The difference was observed to be statistically highly significant (t=12.54, p<0.001) for all the admitted children; for boys (t=8.085, p<0.001); for girls (t=9.647, p<0.001).

Similarly for girls the mean MUAC at admission was 11.8±0.7 cm and at discharge was 12.20±0.7 cm and the difference was statistically highly significant (t=9.647, p<0.001) (Table 3). The average weight gain for the study group during their stay at the centre was 7.9±1.6 g/kg/day.

DISCUSSION

Present study showed that out of the 170 children admitted to NRC, majority of them (41.77%) belonged to 12-23 months. The proportion of females (51.76%) among the admitted children was greater and majority of the children (56.47%) belonged to class V i.e. lower class.

These three important features should be given priority in programs for tackling malnutrition. Similar finding were reported in study conducted by Sanghvi J et al among 300 malnourished children admitted at a NRC, Indore which revealed more number of females (52%) were admitted as compared to males (48%).[7]

A study done by Rakesh Kumar et al among 104 malnourished children admitted in a hospital in Rewa district in which around 75% families belonged to lower socio-economic status.[8] Weight has been taken as the main anthropometric measure as an improvement in

weight of severe malnourished children has the most significant effect in reducing the mortality among them. Overall mean weight at admission was 7.19±1.57 kgs and the overall mean weight at discharge is 7.94±1.77 kgs.

A statistically significant difference was found between mean weight at admission and mean weight at discharge for all children (t=4.133; p<0.001), for males it was t=2.96 p=0.003 and for females t=2.842 p<0.005. A study done by Rawat et al revealed that mean weight on admission was 6.4 kg and on discharge 7.09 kg and there were no statistically significant difference observed between the mean weight at discharge and the mean weight at admission.[9] Cole craft et al in a study at four day care NRCs also reported a significant increase in weight for age for the admitted children.[10]

Present study showed that mean MUAC at admission was 11.8±0.7 cm and at discharge was 12.13±0.7cm. The difference was observed to be statistically highly significant (t=12.54, p<0.001). The mean MUAC for the boys at admission was 11.7±0.8cm and at discharge it was 12.06±0.7cm which was statistically highly significant (t=8.085, p<0.001). Similarly for girls the mean MUAC at admission was 11.8±0.7 cm and at discharge was 12.20±0.7 cm. The observed difference being statistically highly significant (t=9.647, p<0.001). This is similar to study done by G Taneja et al among

children admitted to NRCs in Madhya Pradesh which revealed that mean MUAC at admission was 11.32±1.18cm and at discharge was 11.94±1.38cm. The difference was observed to be statistically significant (t=9.548, p<0.001).[11]

The mean MUAC for the boys at admission was 11.33±0.98cm and at discharge it was 11.87±1.01cm which was statistically significant (t=6.876, p<0.001). Similarly for girls the mean MUAC at admission was 11.31±1.38 cm and at discharge was 12.01±1.33cm. The observed difference being statistically significant (t=6.723, p<0.001).

The average weight gain for the study group during their stay at the centre was 7.9±1.6 g/kg/day; for males being 7.9±1.7g/kg/day; for females it is 7.8±1.6 g/kg/day. In a study done by Mamidi et al in Hyderabad the average weight gain was 5g/kg/day whereas in a study done by G Taneja et al it was 9.25±5.8g/kg/day.[11,12] In present study 86% of the children did not achieve more that 15% of their initial weight. A study done by Aguyo et al showed that 81.6% did not achieve the target weight.[13]

The average length of stay at the NRC was 7.17±1.6 days as opposed to the guidelines of 14days of duration. This is far less than that seen in other studies conducted by Rinki Shah et al where the duration was 16 days and G Taneja et al where the duration of stay was 14 days.[11,14] Majority of parents who did not stay for 14days gave the reason that relatives were not agreeing for treatment at NRC. People belonging to urban areas may not be willing to stay at NRC when their houses are in that region so they leave the NRC when the child feels better even though he may not have gained weight.

CONCLUSION

NRCs provide live-saving care for children with SAM as demonstrated by the impact on the selected anthropometric indicators of the malnourished children. However protocols have to be improved to increase the number of children attaining the target weight.

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