REHABILITATION CENTER FOR NUTRITION: A NOVEL APPROACH

Dr. Pinakini P. Solanki¹, Dr. Priti P Patel², Dr. Vijay Shah³

¹Assistant Professor Dept. of Paediatrics Govt. Medical College, Surat, Gujarat.

²Assistant Professor Dept. of Paediatrics Govt. Medical College, Surat, Gujarat.

³Head of Department, Dept. of Paediatrics Govt. Medical College, Surat, Gujarat

Article Info: Received 14 October 2019; Accepted 11 November. 2019

DOI: <https://doi.org/10.32553/ijmbs.v3i11.730>

Corresponding author: Dr. Priti P Patel

Conflict of interest: No conflict of interest.

Abstract

Introduction: Malnutrition is a pathological state of deficiency or excess of nutrients. Under-nutrition indicates a state wherein the weight for age, height for age, and weight for height indices are below-2 Z-score of the National Centre for Health Statistics (NCHS) norms. In children aged <5 years under nutrition is one of the most common causes of morbidity and mortality. There is significant increase in the risk of case fatality rate in severe acute malnutrition (SAM) children suffering from diarrhoea, measles, and pneumonia. Revised estimates with the use of the new WHO Child Growth Standards in developing country situations has resulted in a 2–4 times increase in the number of infants and children falling below-three standard deviation (3SD) weight for height/length as compared to that of using the former NCHS reference.

Material and Methods: The study was conducted on sample size of 100 children and were then followed up for the period of 2 months to assess the nutritional status during the period of initial stay and the entire follow-up period using available records of anthropometric indicators of the admitted children recruited in the study at the Nutrition Rehabilitation Center (NRC). Weight at admission and discharge and daily weights were recorded from the NRC registers; average weight gain was calculated.

Results: A total of 100 patients were included in the study of which 54 (54%) were girls and 46 (46%) were boys. The mean age duration for the entire group was 26.45 ± 12.23 months; for boys 25.87 ± 12.54 months and for girls 23.66 ± 12.88 months. 51% of the parents of the admitted children were illiterate, 48% had received education up to primary school, and 1% of the parents were graduates. 49% of the parents of the admitted children were daily wage labourers, while 36% of the mothers were housewives. The average weight gain for the study group during their stay at the centers was 9.34 ± 4.33 g/kg/day; for boys the average weight gain being 8.11 ± 5.27 g/kg/day and for girls 10.29 ± 5.99 g/kg/day. The mean MUAC at admission was 11.38 ± 0.96 cm and at discharge it was 11.99 ± 1.68 cm. The difference was observed to be statistically significant ($P < 0.001$). Dropout rates of 10%, 32%, 48%, and 70% were obtained for the four follow-up visits conducted 15 days, 30 days, 45 days, and 60 days from the day of discharge.

Conclusion: Children belonging to illiterate mothers have the highest rates of malnutrition. There was a significant difference between mean weight at discharge and the mean weight at admission for the entire study group which is really satisfying the need of NRC.

Introduction

Malnutrition is a pathological state of deficiency or excess of nutrients. Under-nutrition indicates a state wherein the weight for age, height for age, and weight for height indices are below-2 Z-score of the National Centre for Health Statistics (NCHS) normsⁱ. In children aged <5 years under nutrition is one of the most common causes of morbidity and mortalityⁱⁱ. The prevalence of underweight children in India is about 48%. Chhattisgarh, Gujarat, Uttar Pradesh, and Orissa are estimated to have about 40% underweight childrenⁱⁱⁱ. India continues to remain home to one quarter of the world's undernourished population, over a third of the world's underweight children.

Hunger leads to sluggish growth and requires complementary. In 2014, prevalence of underweight (too thin for age) in Gujarat is estimated to be at 10.4% whereas wasting (too thin for height) is estimated to be at 11.4%. Stunting (too short for age) is estimated to be at 37.2%. In Surat 10.59% were moderate underweight, 1.29% were severe underweight, thus the total underweight were estimated to be 11.88%^{iv}.

The concept of Nutrition Rehabilitation Centre (NRC) as an approach to tackle malnutrition and tackle SAM was proposed in 1955^v. There is significant increases the risk of case fatality rate in severe acute malnutrition (SAM) children suffering from diarrhoea,

measles, and pneumonia. Revised estimates with the use of the new WHO Child Growth Standards in developing country situations has resulted in a 2–4 times increase in the number of infants and children falling below-three standard deviation (3SD) weight for height/length as compared to that of using the former NCHS reference^{vi}.

MATERIAL AND METHODS

The present study was conducted in NRC located in Surat, in the state of Gujarat at Dept. of Paediatrics Govt. Medical College, Surat, Gujarat. The study was conducted on sample size of 100 children and were then followed up for the period of 2 months to assess the nutritional status during the period of initial stay and the entire follow-up period using available records of anthropometric indicators of the admitted children recruited in the study at the NRC. Weight at admission and discharge and daily weights were recorded from the NRC registers; average weight gain was calculated. Appropriate statistical tests were applied to ascertain any significant difference between the mean weights at discharge and the mean weight at admission for the study group. In addition, the mid upper arm circumference (MUAC) and grades of malnutrition at admission and discharge were also recorded and the average duration of stay at the centres studied to establish any difference amongst the different age groups. Each children included in the study were followed up for 2 months to observe the compliance during the follow-up period; follow-up records at the centres were analysed to calculate the number of subjects with weight gain at each follow-up visit, and the mean weight gain compared to the previous follow-up visit.

The data were entered into Microsoft excel spreadsheet and analysed using SPSS version 21.0. Statistical tests such as *t*-test, χ^2 test, and ANOVA were applied.

RESULTS

A total of 100 patients were included in the study of which 54 (54%) were girls and 46 (46%) were boys. The mean age duration for the entire group was 26.45 ± 12.23 months; for boys 25.87 ± 12.54 months and for girls 23.66 ± 12.88 months. 51% of the parents of the admitted children were illiterate, 48% had received education up to primary school, and 1% of the parents were graduates. 49% of the parents of

the admitted children were daily wage labourers, while 36% of the mothers were housewives.

Table 1: Sociodemographic profile

Profile	N=100	%
Male	46	46%
Female	54	54%
Mean age in months (boys)	25.87 ± 12.54	
Mean age in months (girls)	23.66 ± 12.88	
Illiterate parents	51	51%
Education up to primary level	48	48%
Education Up to Graduation	1	1%

The average weight gain for the study group during their stay at the centers was 9.34 ± 4.33 g/kg/day; for boys the average weight gain being 8.11 ± 5.27 g/kg/day and for girls 10.29 ± 5.99 g/kg/day.

Table 2: Malnourishment at the time of admission and discharge

Z score	% at time of admission	% at time of Discharge
-2SD to -3SD	3.2 %	10.4%
-3SD to -4SD	54.2%	55.8%
< -4SD	42.6 %	33.8 %

A statistically significant difference was obtained as regards to the number of severely malnourished children $P < 0.001$.

The mean MUAC at admission was 11.38 ± 0.96 cm and at discharge it was 11.99 ± 1.68 cm. The difference was observed to be statistically significant ($P < 0.001$).

Out of a total 100 children available for analysis for the first two follow-up visits, 90 children reported for the first follow-up visit and 68 for the second. Similarly of the 68 children available for analysis for the third and fourth follow-up visits, 42 children reported for the third and 30 children for the fourth visit. Dropout rates of 10%, 32%, 48%, and 70% were obtained for the four follow-up visits conducted 15 days, 30 days, 45 days, and 60 days from the day of discharge as per recommended guidelines. This dropout rate at each follow-up visit was found to be statistically significant ($P < 0.001$).

DISCUSSION:

The study shows that a major proportion of the admitted children belonged to the marginalized population groups. This study also shows that children belonging to illiterate mothers have the

highest rates of malnutrition these findings are in accordance with that of NFHS-III^{vii}.

Our study shows a statistically significant difference between the mean weight at discharge and the mean weight at admission for the entire study group. Colecraft *et al.* in their study at four day care NRCs also reported a significant increase in weight for age for the admitted children^{viii}. In our study average weight gain was 9.34 ± 4.33 g/kg/day; for boys the average weight gain was 8.11 ± 5.27 g/kg/day and for girls 10.29 ± 5.99 g/kg/day, Savadogo *et al.* in their study of management of severe acute malnutrition in an urban nutritional rehabilitation center in Burkina Faso reported an average weight gain of 10.18 ± 7.05 g/kg/day which was in accordance with our study^{ix}.

The mean duration of stay in the centre was 13.24 days it was much less than earlier programmes for children with severe Protein Energy Malnutrition^{xxi}.

The mean MUAC at admission in this study was 11.38 ± 0.96 cm and at discharge it was 11.99 ± 1.68 cm. The difference was observed to be statistically significant ($P < 0.001$). In our study most of the parents in the study belonged to poor socioeconomic background. This limits the accessibility to even cheap locally available food, as shown by earlier studies⁸.

CONCLUSION

Children belonging to illiterate mothers have the highest rates of malnutrition. There was a significant difference between mean weight at discharge and the mean weight at admission for the entire study group. Thus NRCs had a positive impact on the selected anthropometric indicators of severe malnourished children but lag behind in the educational aspect and ensuring proper follow-up visits.

REFERENCES

- ⁱ National Centre for Health Statistics. Centers for Disease Control and Prevention. [Last accessed on 2015 Jun 10]. Available from: <http://www.cdc.gov/nchs/index.htm>
- ⁱⁱ Collins S, Dent N, Binns P, Bahwere P, Sadler K, Hallam A. Management of severe acute malnutrition in children. *Lancet*. 2006 Dec 2; 368(9551):1992-2000.
- ⁱⁱⁱ Lim SL, Ong KC, Chan YH, Loke WC, Ferguson M, Daniels L. Malnutrition and its impact on cost of hospitalization, length of stay, readmission and 3-year mortality. *Clin Nutr*. 2012 Jun; 31(3):345-50.

- ^{iv} <http://gcsra.org/writereaddata/images/pdf/IP-Malnutrition.pdf>
- ^v Bengoa Jm. Nutritional Rehabilitation Programmes. *J Trop Pediatr Afr Child Health*. 1964 Dec; 10():63-4.
- ^{vi} de Onis M. WHO Child Growth Standards: Length/Height-for-Age, Weight-for-Age, Weight-for-Length, Weight-for-Height and Body Mass Index-for-Age. World Health Organization. 2006
- ^{vii} Mumbai: IIPS, ORC Macro; 2005. International Institute of Population Sciences. National Family Health Survey –3.
- ^{viii} Colecraft EK, Marquis GS, Bartolucci AA, Pulley L, Owusu WB, Maetz HM. A longitudinal assessment of the diet and growth of malnourished children participating in nutrition rehabilitation centres in Accra, Ghana. *Public Health Nutr*. 2004;7:487-94.
- ^{ix} Savadogo L, Zoetaba I, Donnen P, Hennart P, Sondo BK, Dramaix M. Management of severe acute malnutrition in an urban nutritional rehabilitation center in Burkina Faso. *Rev Epidemiol Sante Publique*. 2007;55:265-74.
- ^x Beghin ID, Viteri FE. Nutritional rehabilitation centres: An evaluation of their performance. *J Trop Pediatr Environ Child Health*. 1973;19:403-16.
- ^{xi} Schneideman I, Bennett FJ, Rutishauser IH. The Nutrition Rehabilitation Unit at Mulago Hospital-Kampala: Development and Evaluation, 1965-67. *J Trop Pediatr Environ Child Health*. 1971; 17 Monograph 13, 25-34 (54)