



Pattern of Co-morbidities in Children with Severe Acute Malnutrition admitted in MTC of a teaching hospital of Western Rajasthan, India

Authors

Dr Tarachand Saini¹, Dr Anita Verma^{2*}, Dr P.K.Berwal³

¹Incharge of Malnutrition Treatment Center, Department of Paeditrics, S. P. Medical College, Bikaner, Rajasthan, INDIA

^{2*}Assistant Professor, Department of Biochemistry, S. P. Medical College, Bikaner, Rajasthan, INDIA

³Professor and Head of Dept, Department of Paeditrics, S. P. Medical College, Bikaner, Rajasthan, INDIA

*Corresponding Author

Dr Anita Verma

Assistant Professor, Department of Biochemistry, S. P. Medical College, Bikaner, Rajasthan, INDIA

Phone (or Mobile) No.: +91- 9460995741

Email: anita.verma.meena@gmail.com

Abstract

Objective: To study the pattern of co-morbidities in children having Severe Acute Malnutrition in MTC attached to a teaching hospital.

Methods: In a span of five years all the children (1082), admitted in MTC of PBM Hospital, S.P. Medical College Bikaner, were studied for presence of one or more comorbid conditions along with severe acute malnutrition.

Results: Out of the 1082 children who were admitted to Malnutrition Treatment Center (MTC), acute respiratory infection is the most common (55.17%) co-morbidity in children with Severe Acute Malnutrition and followed by Anaemia (43.17%). Out of 1082 children having SAM 63.58% children were having one co-morbidity, 26.89% were having two co-morbidity and 9.42% were having more than two co-morbidity.

Conclusions: It is imperative to suspect and anticipate co-morbid condition in these children. High index of suspicion for these co-morbidities is the key to reduce mortality and better outcome in children having acute severe malnutrition.

Keywords: severe acute malnutrition (SAM), malnutrition treatment center (MTC), co-morbidity

Introduction

A round the globe nearly 20 million children below the age of five year, having Severe Acute Malnutrition (SAM) and contributing to one million deaths every year in this age group¹. According to National Family Health Survey-III, conducted during 2005-2006 in India, 6.4% of children below 60 months of age were suffering

from this malady (weight-for-height less than – 3SD). With the current estimated total population of India as 1100 million, it is expected that there would be about 132 million under-five children and amongst these about 6.4% or 8.1 million are likely to be suffering from SAM. In India more than 5 million children die every year as a direct or indirect result of malnutrition². This high

mortality rate in children, especially in less developed countries like ours, with complicated SAM is because of co-morbid conditions namely infections and micronutrient deficiencies³. Anticipation and early detection of some of these co-morbid conditions, along with preventive measures may bring down this unacceptably high mortality statistics³⁻⁵.

Due to paucity of systematic reporting of clinical and laboratory data at the time of admission or during hospital stay to identify baseline risk factors and presence of these conditions. this is not allowing doing comparative studies of the burden, spectrum and outcome of co-morbidities associated with SAM. Here we present a description of co-morbid findings in children admitted to a tertiary level hospital in central India.

Methods

This retrospective study was carried out in the MTC attached to Department of Pediatrics, PBM Hospital and Sardar Patel Medical College, Bikaner, Rajasthan, from Aug.2010 to July 2015. All children between One to sixty months of age with severe acute malnutrition (SAM) admitted in the Malnutrition Treatment Centre were included. WHO criteria were followed for diagnosis and need for admissions in children suffering from severe acute malnutrition^{6,7}. Children having obvious or suspected, congenital malformation and genetic disorders including thalassemics were excluded from this study. Complete history was obtained and general physical and systemic examination was done in each case. Demographic parameters were also noted. Apart from this clinical signs of micronutrient deficiencies were also assessed in every child. Frequencies of various co morbid conditions in study population were recorded.

Results

Out of 1082 children having SAM 31.42% were females and 68.53% were male. Most of the children (51.75%) brought to MTC between 1-3

years in age. Mean age of presentation was 19.7 months. Immunization status of these children was as follows, complete till date in 31.14%, partially immunized in 51.75% and nil in 17.709% of the children respectively.

In children having SAM, Anaemia, Acute respiratory infections and acute gastrointestinal infections were the most common co-morbid conditions in our study. 55.17% of children were having ARI, 43.16% of children were having Anaemia and 25.69% were suffering from gastrointestinal infections in this study group.

Out of 1082 children having SAM 63.58% children were having one co-morbidity, 26.89% were having two co-morbidity and 9.42% were having more than two co-morbidity.

Discussion

Mean age of children reporting with malnutrition was similar to other studies and there was no significant sex predominance in malnourished children⁷⁻⁹. Anaemia, Diarrhoea and acute respiratory infection were the three most common co morbid diseases. Previous studies have also reported that malnourished children suffer in greater proportion from bacterial gastrointestinal and respiratory infections¹⁰. In a Colombian study, 68.4% of malnourished children were suffering from diarrhoea and 9% had sepsis at the time of admission⁹. Two African studies also showed high incidence of diarrhoea in SAM children of 49% and 67%^{11,12}. 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^{15,16}. Anaemia was most common micronutrient deficiencies associated with malnutrition in our study, and this is consistent with the previous reports¹⁴. The high incidence of anaemia in these children could be due to nutritional factors as well as incidental helminthic infections. Other micronutrient deficiencies seen in this study have also been previously reported with similar prevalence¹⁵.

Table 1. Demographic and other general parameters of studied children

Age 6-11mo(370)34.19%, 12-35mo(560)51.75% & 36-59mo(152)14.04% mean age 19.8months
Sex male 742(68.57%) Female 340(31.42%)
Immunization status complete 347 (31.14%) partial 560(51.75%) nil 185(17.09%)

Table 2. Pattern of co-morbid conditions in studied population.

Co morbid condition	Number	percentage
Acute Respiratory Infection	597	55.17%
Acute Gastrointestinal Infection	278	25.69%
Anaemia	467	43.16%
Fever	184	17.00%
Tuberculosis	26	2.40%
Skin disease	91	8.41%
Urinary tract infection	102	9.42%

Table 3. Pattern Number of co-morbid conditions in studied population.

Number of co-morbid	Number	percentage
One	688	63.58%
Two	292	26.98%
More than two	102	9.42%

Conclusion

Apart from nutritional rehabilitation, timely identification and treatment of co-morbidities like acute respiratory tract infection, diarrhoea, anemia and micronutrient deficiencies is also needed in malnourished children, so as to break under nutrition-disease vicious cycle. High index of suspicion and sensitization of MTC team, towards co-morbidities is of paramount importance, to decrease mortality and to improve outcome in these less blessed children.

References

1. International Institute for Population Studies (IIPS) and Macro International. National Family Health Survey (NFHS-3), 2005-2006. IIPS, Mumbai, India, 2007.
2. Umesh kapil, HPS Sachdev Indian Pediatrics 651 vol 47, August 17, 2010.

3. Steve Collins Treating Severe Acute Malnutrition seriously, Arch Dis. Child. 2007 May;92(5):453-461.
4. Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, et al. Maternal and child under nutrition: global and regional exposures and health consequences. Lancet. 2008;371:243-60.
5. Heikens GT. How can we improve the care of severely malnourished children in Africa? PLoS Med. 2007;4:e45.
6. World Health Organization (WHO) Guidelines for Inpatient Treatment of Severely Malnourished Children. WHO, Geneva, Switzerland, 2003.
7. Indian Academy of Pediatrics (IAP). IAP Guidelines 2006 for hospital-based management of severely malnourished children (adapted from WHO Guidelines). Indian Pediatr. 2007;44:443-61
8. De Onis M, Monteiro C, Akre J, Clugston G. The worldwide magnitude of protein-energy malnutrition: An overview from the WHO global database on child growth. Bull World Health Organ. 1993;71:703-12.
9. Bernal C, Velásquez C, Alcaraz G, Botero J. Treatment of severe malnutrition in children: Experience in implementing the world health organization guidelines in turbo, Colombia. J Pediatr Gastroenterol Nutr. 2008;46:322-8.
10. Scrimshaw NS, SanGiovanni JP (1997) Synergism of nutrition, infection, and immunity: An overview. Am J Clin Nutr 66:464S-477S.
11. Talbert A, Thuo N, Karisa J, Chesaro C, Ohuma E, Ignas J, et al. Diarrhoea complicating severe acute malnutrition in Kenyan children: A prospective descriptive study of risk factors and outcome. PLoS One. 2012; 7:1.
12. Irena AH, Mwambazi M, Mulenga V. Diarrhea is a major killer of children with severe acute malnutrition admitted to

inpatient set-up in Lusaka, Zambia.
Nutrition J.2011;10:110.

13. Bhaskaram P. Measles and malnutrition.
Indian J Med Res. 1995;102:195-99.

14. Ejaz MS, Latif N. Stunting and
micronutrient deficiencies in malnourished
children. J Pak Med Assoc. 2010;60:543-
7.

15. 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.