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Original article

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

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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 two years all the children (421), admitted in MTC of SRG Hospital Medical College Jhalawar, were studied for presence of one or more co-morbid conditions along with severe acute malnutrition.

Results: Out of the 421 children who were admitted to Malnutrition Treatment Corner (MTC), acute respiratory infection is the most common (37.3%) co-morbidity in children with Severe Acute Malnutrition. Followed by acute gastrointestinal infection. Significant number of children was having urinary tract infections. Tuberculosis was diagnosed in 23% of children. Pyogenic skin infections were found in 14.7% cases. As micronutrient deficiencies present as part of Protein Energy Malnutrition, vitamin deficiencies of all vitamins A, C, D and B group were found in 28% of children and 87% of children were having anemia. Malaria and measles were also diagnosed in few study subjects, but they were not considered as significant co-morbid conditions

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: Co-morbidities; Infections; MTC; SAM.

INTRODUCTION

Around the globe nearly 20 million children below the age of five, 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, SRG Hospital and Jhalawar Medical College, Jhalawar Rajasthan, from July 2012 to June 2014. All children between six 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 disorder including thalassemic 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 421 children having SAM 57.48% were females and 42.51% were male. Most of the children (57.95%) brought to MTC between 1-3 years 39.9% was in age. Very few children (2.13%) past the age of 3 years presented at MTC. Mean age of presentation was 16.2 months. 81.2% cases had their weight for height below -3SD, 21.14% cases had severe visible wasting, and 7.83% had bilateral pitting edema. Around 80.5% families belonged to lower socio-economic status. Feeding practises had not shown any sex preference. 8% of the children didn't received breast feed at all, and around 29% of children were exclusively breast fed (fig. 1). Immunization status of these children was as follows, complete till date in 43.7%, partially immunized in 51.54% and nil in 4.75% of the children respectively (Table 1).

In children having SAM, Acute respiratory infections and acute gastrointestinal infections were the most common co-morbid conditions in our study. 37.7% of children were having ARI, and 24.1% were suffering from gastrointestinal infections. Urinary tract infections were also common (15.2%) in this study group.

DISCUSSION

Mean age of children reporting with malnutrition was similar to other studies and there was no significant sex predominance in malnourished children⁷⁻⁹. Diarrhoea and acute respiratory infection were the two most common co morbid diseases followed closely by tuberculosis. Previous studies have also reported that malnourished children suffer in greater proportion from bacterial gastrointestinal and respiratory infections¹⁰. Absence of a comparative group, no biochemical evaluation for micronutrient deficiencies and non-assessment of contributing factors for these deficiencies were the main lacunae of the study. 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}. Though previous reports have described malnutrition as an important risk factor for pneumonia than for diarrhoea¹³, diarrhoea was the major co-morbid condition found in our study. A study from Africa¹⁴ also reported a comparable incidence of respiratory illness and tuberculosis (18% each) in admitted SAM children. Measles has severe consequences on the nutritional status. A previous Indian study¹⁵ showed only 3- 4% of children with past history of measles but we found a higher proportion. Malaria and HIV infection were previously reported as major co-morbidities with total prevalence of 21% and 29.2%, respectively¹³ but data from our hospital showed a comparatively lesser incidence. 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 and vitamin D deficiency were the two most common micronutrient deficiencies associated with malnutrition in our study, and this is consistent with the previous reports¹⁷. 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 prevalence¹⁶⁻¹⁸.

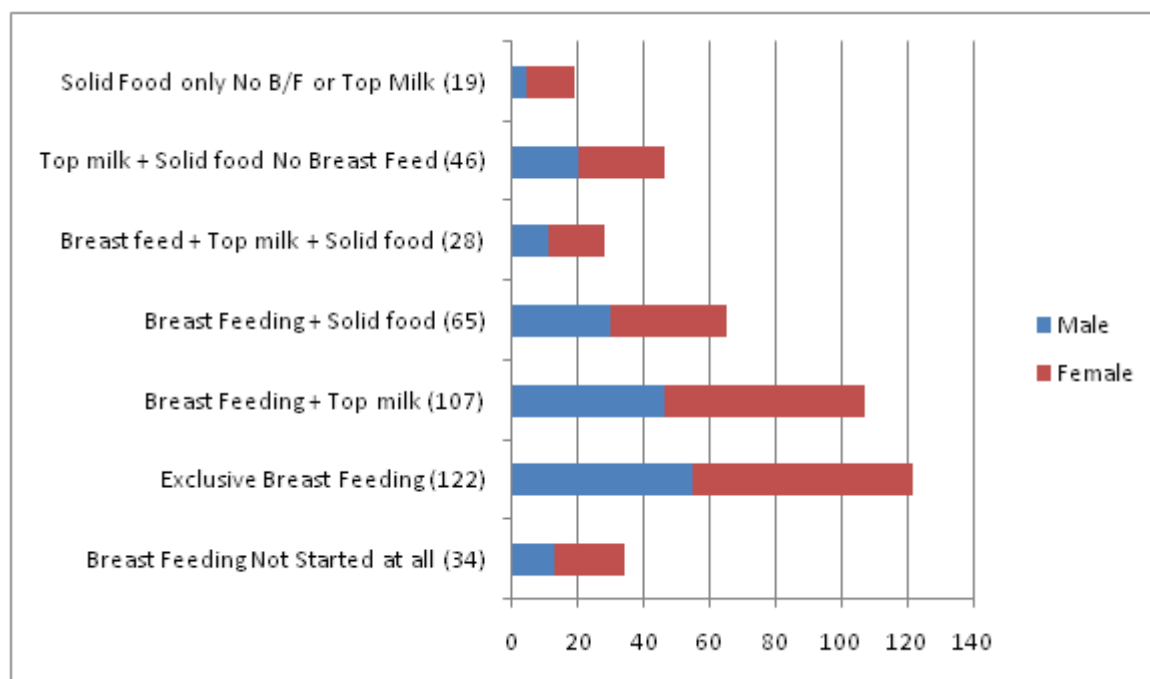


Figure 1. Feeding / Dietary profile of studied children Male (179)- Female (242) Total 421.

Table 1. Demographic and other general parameter of studied children.

Parameters	
Age	6-11mo(168)39.90%, 12-35mo(244)57.95% & 36-59mo(9)02.13% mean age 18.2months
Sex	Male (179)42.51% female(242)57.48%
Immunization	Complete till date (184) 43.7% Partial (217) 52% & Nil (20)4.75%
Development	Development at Par (264) 62.7%
Severe visible Wasting	Present in (89) 21.14%
B/L Pitting edema	Present in (33) 7.83%
MUAC<11.5	Less than 11.5 cm in (183)72.33% Measured only in 253 children of >1 year
Socio economic Status	Low in (339) 80.5%

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

Co-morbidity	Number (421)%	Age 6-11months (168)	Age 12-35 months (242)	Age 3 years to 5 years(9)
Acute Respiratory Infection	(159)37.7%	(73)	(84)	(2)
Acute Gastrointestinal Infection	(102)24.1%	(34)	(69)	(1)
Urinary Tract Infection	(64)15.2%	(41)	(21)	(2)
General Sepsis	(24)5.7%	(16)	(8)	0

Meningitis	(21)4.9%	(9)	(12)	0
Osteomyelitis	(3)0.7%	0	(3)	0
Pertusis	(27)6.4%	(6)	(21)	0
Enteric Fever	(19)4.5%	0	(19)	0
Measles	(18)4.2%	(8)	(10)	0
Tuberculosis	(97)23%	(32)	(61)	(5)
Malaria	(14)3.3%	(7)	(7)	0
Skin infection pyogenic	(62)14.7%	(25)	(36)	(1)
Skin infection Scabies	(19)4.5%	(13)	(6)	0
Skin infection fungal	(4).9%	(1)	(3)	0

Table 3. Co existing Nutritional Deficiencies in Children with SAM.

Nutritional Deficiency	(n=421)%	Age 6-11 month (n=168)%	Age 12-35 month (n=242)%	Age 3 -5 yrs(n=9)%
Anemia	(368) 87.41	(154) 91.66	(208) 85.95	(6) 66.66
Vitamin A Deficiency	(67) 15.91	(17) 11.11	(49) 20.24	(1) 11.11
Vitamin B Deficiency	(44) 10.45	(13) 07.73	(29) 11.98	(2) 22.22
Vitamin C Deficiency	(56) 13.3	(29) 17.26	(26) 10.74	(1) 11.11
Vitamin D Deficiency	(79) 18.76	(34) 20.23	(45) 18.59	(0)

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 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.

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