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TO DESCRIBE ASSOCIATED CO-MORBIDITIES IN SEVERE ACUTE MALNUTRITION AMONG HOSPITALIZED CHILDREN OF EITHER GENDER FROM 6–59 MONTHS OF AGE IN THE TERTIARY CARE HOSPITAL

Paediatrics

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ABSTRACT

BACKGROUND: Severe acute malnutrition is a major public health issue. It affects an estimated 8.1 million under-five children in India . Nearly 0.6 million deaths and 24.6 million disability adjusted life years are attributed to this condition. Diarrhoea and pneumonia account for approximately half the under-five deaths in India and malnutrition is believed to contribute to 61% of diarrheal deaths and 53% pneumonia deaths . India is at the epi centre of this crisis despite the country's recent economic growth. Strong scientific evidence exists on synergism between under nutrition and child mortality due to common childhood morbidities including diarrhea, acute respiratory infections, malaria and measles. In severe acute malnutrition, the case fatality rates related to these morbidities are excessively high. The aim of our study is to describe the comorbidities in hospitalized children with SAM

Methods: The present study was conducted in the Post Graduate Department of Pediatrics, SMGS Hospital, Government Medical College, and Jammu of either gender from 6–59 months of age admitted in hospital .A total of 120 children were taken up for study. Out of these 57 children had weight for height/length above -2 SD/Z score of WHO growth standards. These were taken as controls. Rest 63 children with inclusive criteria like weight for height/length <-3 SD/Z, visible severe wasting, presence of bipedal edema and /or mid upper arm circumference

Results: Out of a total of 120 children, 63 (52.50%) were cases of severe acute malnutrition and 57 (47.50%) were taken up as controls. Most cases were seen in the age group of 12-18 months (20; 31.75%), followed by 18-24 months (10; 15.87%) Most controls were seen in the age group of 18-24 months (20; 35.09%), followed by 12-18 months (10; 17.54%). Out of all the 63 cases, the most common co-morbidity seen was persistent diarrhea (22.22%), and recurrent RTI (20.63%), followed by measles (14.28%), recurrent otitis media (12.69%) by sepsis (11.11%). And the least common were skin infections like pyoderma, scabies (7.93%), whooping cough (6.35%) and corneal ulceration (4.7%) was the least commonly associated comorbidity.

Conclusion: Timely identification and treatment of various co-morbidities is likely to break undernutrition-disease cycle, and to decrease mortality and improve outcome.

KEYWORDS

Severe Acute Malnutrition, Comorbidity, Hospitalization, India

INTRODUCTION

Severe acute malnutrition is a major public health issue. It affects an estimated 8.1 million under-five children in India **(IIPS, 2006)**. Nearly 0.6 million deaths and 24.6 million disability adjusted life years are attributed to this condition. Diarrhoea and pneumonia account for approximately half the under-five deaths in India and malnutrition is believed to contribute to 61% of diarrheal deaths and 53% pneumonia deaths **(Black *et al.*, 2008)**.

India is at the epicentre of this crisis despite the country's recent economic growth **(UNCEF, 2009a)**. Strong scientific evidence exists on synergism between under nutrition and child mortality due to common childhood morbidities including diarrhoea, acute respiratory infections, malaria and measles. In severe acute malnutrition, the case fatality rates related to these morbidities are excessively high.

Most deaths of children 6-59 months old are related to malnutrition and infection **(NDoH, 2005; Torun, 2006)**. **Caulfield *et al.* (2004)** found that the principal causes of deaths in young children globally in 2004 were: diarrhoea (60.7%), pneumonia (52.3%), measles (44.8%) and malaria (57.3%). All of these can also worsen malnutrition.

There is a lack of systematic reporting of clinical and laboratory data on admission or during hospital stay to identify baseline risk factors that allow comparative studies of the burden, spectrum and outcome of co-morbidities of severe malnutrition. Here we present a description of co-morbid findings in children admitted to a tertiary level hospital in central India

MATERIAL AND METHODS

This study was conducted in the Post Graduate Department of Paediatrics, SMGS Hospital, Government Medical College, Jammu on children of either gender from 6–59 months of age admitted in hospital among 120 children (63 males and 53 females). Out of these 57 children had weight for weight/height above -2 SD/Z score of WHO growth standards. These were taken as controls. Rest 63 children with inclusive criteria were selected.

Case definition of severe acute malnutrition as outlined by WHO was used (any one of the following):

- weight for height/length or weight/length <-3 SD/Z,
- visible severe wasting (of nutritional origin),
- presence of bipedal edema and /or mid upper arm circumference <11.5 cm

Inclusion Criteria:

Children age 6 months to 59 months both male and female with WHO case definition on admission were included in the study.

Exclusion Criteria:

Children with acute secondary problems like cerebral palsy, meningitis, infiltrative disorders, congenital malformations, chronic systemic disease were excluded.

METHODS:

- Detailed anthropometric measurements were recorded
- Thorough history was taken & detailed general physical and systemic examination was done and clinical signs of micronutrient deficiencies were assessed. Frequencies of various co morbid conditions were recorded
- All children were subjected to appropriate investigations like complete blood counts, blood sugar , serum electrolytes, serum protein, urine routine , blood and urine culture , stool routine ,PBF for malaria parasite , chest x ray, gastric aspirate for AFB , HIV serology in cases of high index of suspicion.

Statistical Analysis

The data was analysed with the help of statistical program SPSS

VERSION 17.0. CHI SQUARE test was applied to compare the proportions and p value <0.05 was considered as statistical significant. The odd's ratio (OR) > 1 is positively correlated with malnutrition and or <1 negatively correlated. Qualitative variables were represented as percentages.

RESULTS AND OBSERVATIONS:

A total of 120 children were taken up for study. Out of these 57 children had weight for height/length above -2 SD/Z score of WHO growth standards. These were taken as controls. Rest 63 children with inclusive criteria like weight for height/length <-3 SD/Z, visible severe wasting, presence of bipedal oedema and /or mid upper arm circumference <11.5 cm were categorized under severe acute malnutrition cases.

Following observations were made:

Table 1: Age distribution of children

Age group (months)	Cases		Controls	
	No.	%	No.	%
6 – 12	5	7.94	5	8.78
12 – 18	20	31.75	10	17.54
18 – 24	10	15.87	20	35.09
24 – 30	9	14.29	8	14.04
30 – 36	6	9.52	4	7.02
36 – 42	4	6.35	4	7.02
42 – 48	4	6.35	1	1.75
>48	5	7.94	5	8.77
Total	**63**	**100.00**	**57**	**100.00**

- Out of a total of 120 children, 63 (52.50%) were cases of severe acute malnutrition and 57 (47.50%) were taken up as controls.
- Most cases were seen in the age group of 12-18 months (20; 31.75%), followed by 18-24 months (10; 15.87%)
- Most controls were seen in the age group of 18-24 months (20; 35.09%), followed by 12-18 months (10; 17.54%).

Table 2:Distribution of children according to associated morbidities observed

Associated morbidities observed*	Cases (n=63)	
	No.	%
Persistent diarrhea	14	22.22
Recurrent RTI	13	20.63
Otitis media	8	12.69
Skin infections	5	7.93
Sepsis	7	11.11
Measles	9	14.28
Whooping cough	4	6.35
Corneal ulceration	3	4.7

***More than one comorbidity was seen in all children**

- Out of all the 63 cases, the most common co-morbidity seen was persistent diarrhea (22.22%), and recurrent RTI (20.63%), followed by measles (14.28%), recurrent otitis media (12.69%) by sepsis (11.11%). And the least common were skin infections like pyoderma, scabies (7.93%), whooping cough (6.35%) and corneal ulceration (4.7%) was the least commonly associated comorbidity. Nutritional deficiencies are detailed in the table 3 with anaemia and rickets being the most common

Table 3: Nutritional deficiencies in study subjects

Deficiency	Number (n)	%
Vitamin B	**10**	**15.87**
Vitamin A	**6**	**9.52**
Rickets	**14**	**22.22**
Anemia	**32**	**50.79**
Scurvy	**8**	**12.6**

DISCUSSION:

Association of various variables with severe acute malnutrition is discussed as follows:

A total of 120 children were taken up for study. Out of these 57 children had weight for height/length above - 2 SD/Z score of WHO growth standards. These were taken as controls. Rest 63 children fulfilling the inclusive criteria were included in the study. **Amsalu and Tigabu (2008)**, **Laghari *et al.* (2013)** also conducted the same study, their inclusion and exclusion criteria were similar to our study.

Sex-wise distribution of the cases in our series showed slight male preponderance (68.25%). This is similar to that reported by **Laghari *et al.* (2013)**. However, study conducted by **Amsalu and Tigabu (2008)** had a female preponderance.

Children with severe malnutrition are more prone to infections than others due to the immunosuppressive effect of malnutrition and the loss of the protective mucosal barrier in the gastrointestinal tract. Moreover, studies have shown that severely malnourished children are more prone to gut barrier dysfunction, *Escherichia coli* bacteraemia and higher mortality from invasive bacterial infection. Among the medical risk factors recurrent diarrhoea, recurrent respiratory tract infections, sepsis, skin infections, measles were the most commonly associated comorbidities in the order of prevalence. This was similar to the previous studies by **Irena *et al.* (2011)** and **Kumar *et al.* (2014)**. Though previous reports have described malnutrition as an important risk factor for pneumonia than for diarrhoea, however, diarrhoea was the major co-morbid condition found in our study (22.22%), followed by recurrent RTI (20.63%). Studies by **Laghari *et al* (2013)** found some higher percentage of cases with diarrhoea in 61% and RTI in 51% of cases. Measles also has severe consequences on the nutritional status. Previous studies **showed** 3-4% of children with past history of measles, **Kumar *et al.* (2014)** found 3.8% cases, but we found it in higher number of cases (9%). In a Colombian study by **Bernal *et al.* (2008)** sepsis was found to be in 9% of cases. Similarly in our study, sepsis was seen in 11% of cases.

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 **(Olaf et al 2005).** 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 reports **(Kumar et al 2014)**

CONCLUSION

We infer that apart from nutritional rehabilitation, timely identification and treatment of co-morbidities like diarrhoea, acute respiratory tract infection, anaemia and micronutrient deficiencies is vital in malnourished children, so as to break undernutrition-disease cycle, and to decrease mortality and to improve outcome.

REFERENCES

1. Amsalu S, Tigabu Z. Risk factors for severe acute malnutrition in children under the age of five: A case control study. Ethiop J Health Dev 2008; 22(1).
2. Bachou H, Tumwine JK, Mwadime RKN, Tylleskar T. Risk factors in hospital deaths in severely malnourished children Kampala, Uganda. BMC Pediatr 2006; 6:7 doi:10.1186/1471-2431-6-7.
3. Black RE, Allen LH, Bhutta ZA, de Onis M, Ezzati M, Mathers C, et al. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet 2008; 371: 243-60.
4. Caulfield LE, De Onis, M, Blossner M, Black RE. Undernutrition as an underlying cause of child deaths associated with diarrhea, pneumonia, malaria and measles. Am J Clin Nutr 2004; 80: 193-98.
5. Ghai textbook of pediatrics 8th edition page 96.
6. Golden MHN, Golden BE. Severe malnutrition. In: Human Nutrition and Dietetics, 10th edition. United Kingdom: Churchill Livingstone, 2000: 515-25
7. Heywood AH, Marshall T, Heywood PF. Motor development and nutritional status of young children in Madang, Papua New Guinea. PNG Med J 1991; 34(2): 109-16.
8. IAP textbook of pediatrics 5th edition page 130.
9. IIPS (International Institute for Population Sciences). National Family Health Survey 3, 2005-2006. India. Mumbai. International Institute of Population Sciences; 2006.
10. 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. Nutr J. 2011 Oct 11;10:110.
11. Kumar R, Singh J, Joshi K, Singh HP, Bijesh S. Co-morbidities in hospitalized children with severe acute malnutrition. Indian Pediatr 2014; 51: 125-127.
12. Laghari GS, Akbar M, Radhan AH, Hussain Z. The analysis of risk factors in severe protein energy malnutrition in order to know their significance for outcome in children from 2 months to 5 years of age. JLUMHS 2013; 12(2): 103-108.
13. NDoH (National Department of Health, South Africa). Guidelines for nutrition interventions at health facilities to manage and prevent child malnutrition. South Africa: Department of Health, 2003.
14. NDoH (National Department of Health: Directorate Nutrition). The
15. Olaf Müller, Michael Krawinkel. Malnutrition and health in developing countries CMAJ. 2005;173:279-86.
16. UNCEF (United Nations Children's Emergency Fund). Child malnutrition and household food insecurity remain major concerns for Bangladesh. Press Centre, 2009a. Available from: http://www.unicef.org/media/media_48981.
17. UNICEF2008 http://www.unicef.org/nutrition/training/2.5/4.html.
18. UNICEF-WHO-The World Bank. Levels and trends in child malnutrition. Joint Child Malnutrition Estimates, 2012.
19. United Nations Children's Fund (UNICEF). Strategy for improved nutrition of children and women in developing countries. A UNICEF Policy Review. New York, USA, 2004.