International Journal of Contemporary Pediatrics
Chandra S et al. Int J Contemp Pediatr. 2016 Nov;3(4):1445-1448
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20163696

Short Communication

Secondary malnutrition: clinico-etiological spectrum

Surabhi Chandra*, D. K. Singh

Department of Pediatrics, S.N. Children's Hospital and M.L.N. Medical College, Allahabad, India

Received: 26 August 2016
Revised: 29 September 2016
Accepted: 04 October 2016

***Correspondence:**
Dr. Surabhi Chandra,
E-mail: surabhi0329@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Secondary malnutrition, a less recognized entity results from an underlying disease that compromises growth directly or indirectly. The present study was undertaken to determine the clinico-etiological spectrum of secondary malnutrition in a tertiary care hospital of India. It also aimed at identifying asymptomatic masqueraders of malnutrition.
Methods: In this prospective, observational study done in a tertiary care hospital over a year (April 2015 – March 2016), all patients admitted were evaluated anthropometrically, as per the World Health Organization (WHO) guidelines, and categorized into having moderate or severe malnutrition. Any underlying secondary cause was worked up and asymptomatic masqueraders were identified on the basis of a pre-devised fixed diagnostic protocol.
Results: One seventy seven patients (177/897 = 19.7 %) of a total of 897 malnourished patients had secondary malnutrition. Seventy eight (78/177 = 44.0%) patients had moderate and 99 (99/177 = 55.9%) had severe malnutrition. Asymptomatic masqueraders of secondary malnutrition were seen in 21 patients. Neurological disorders (54/177 = 30.5%) followed by tropical infections (40/177 = 22.5%), were the major underlying cause of secondary malnutrition.
Conclusions: Identification of secondary malnutrition and treatment of the underlying disorder is a must to achieve optimal nutritional outcomes and decrease the burden of malnutrition.

Keywords: Asymptomatic masqueraders, Malnutrition, Secondary

INTRODUCTION

The prevalence of wasting in less than 5 years age group is 19.8% and of stunting is 48% in India which is the highest in the world.[1] Primary malnutrition is due to the combined effect of multiple factors including low birth weight, lack of adequate food, frequent infections and environmental enteropathy. Secondary malnutrition, on the other hand results from an underlying disease that compromises growth directly or through its deleterious effect on appetite or the absorption of nutrients.[2] This distinction is important since, without treating the underlying cause (for instance; malabsorption, infections), it is impossible to manage secondary malnutrition. The present study was undertaken to determine the clinico-etiological spectrum of secondary malnutrition in a tertiary care hospital from India.

METHODS

It was a time bound, prospective, observational study done in a tertiary care hospital over duration of 12 months (April 2015 - March 2016). Ethical clearance was obtained from the institutional ethics committee.

All patients admitted were evaluated anthropometrically, as per the recent World Health Organization (WHO) guidelines.[3] Malnourished patients (weight/height ≤ 2 SD

(standard deviation)) in the age group of 1month-5years, were included in the study.

Neonates, non-malnourished children and those in whose parents did not consent were excluded from the study. Moderate and Severe Malnutrition were defined as per WHO definitions viz; weight for age -2 to -3 SD and <= -3 SD respectively. 'Faltering' was defined as per criteria mentioned in facility based care manual of management of severe acute malnutrition.[4]

The underlying disorder was worked up and managed according to the patient's clinical history and examination. In the absence of a suggestive history or physical examination, asymptomatic masqueraders of secondary malnutrition were identified on the basis of a pre-devised fixed diagnostic protocol (Figure 1). Data were recorded in a pre-formed, standardized pro forma and later entered into an MS-EXCEL 2007 worksheet and analysed using the software Epi-info version 7.1.5.

RESULTS

Table 1: Etiological spectrum of secondary malnutrition

Organ system	Diagnosis	Moderate malnutrition	Severe malnutrition
Central nervous system			
	Cerebral palsy	3	20
	Epileptic encephalopathies	10	6
	Guillain Barre syndrome	6	
	Infantile tremor syndrome	3	6
	Total	22	32
Cardiovascular system			
	Ventricular septal defect (VSD)	4	18
	Atrial septal defect (ASD)	4	2
	Tetralogy of fallot	1	4
	d-Transposition of great arteries with VSD with pulmonary atresia	1	
	Total	10	24
Respiratory system			
	Bronchial asthma	9	-
	Cystic fibrosis	-	2
	Congenital cystic adenomatoid malformation		2
	Total	9	4
Gastrointestinal system			
	Chronic liver disease	2 (Caroli's Disease)	5
	Malabsorption syndrome		2 (Celiac Disease)
	Inflammatory bowel disease		1
	Abdominal koch's		4
	Total	2	12
Urogenital system			
	Chronic kidney disease	1	4
	Congenital urologic abnormality	1 (Horse-shoe shaped kidney with bilateral hydro nephrosis)	2 (Multi cystic renal dysplasia)
	Total	2	6
Hematologic system			
	Congenital haemolytic anaemia	15	2
	Hematologic malignancy		4
	Total	15	6
Musculoskeletal system			
	Juvenile idiopathic arthritis	3	
	Total	3	0
Tropical infections			
	Tuberculosis	12	20
	Human immunodeficiency virus positive	3	3
	Kala azar	-	2
	Total	15	25
Grand total		**78**	**99**

The hospital had 4920 admissions during this period of 12 months, including 2952 patients under 5 years of age. A total of 897 (897/2952=30.4%) children were found to be malnourished. One seventy seven (177/897=19.7 %)

of the total malnourished patients had secondary malnutrition. The mean age of presentation was 24.18 months (range 1.5-60 months; standard deviation SD =24.96). Male: Female ratio was equal (1.08). Majority (55/102=54%) belonged to rural areas. Mean weight was 9.05 kg (1.0-17.0 kg; SD 4.97).

Seventy eight (78/177=44.0%) patients had moderate and 99 (99/177=55.9%) had severe malnutrition. The underlying etiological spectrum is detailed in Table 1. Neurological disorders (54/177=30.5%) followed by tropical infections (40/177=22.5%), were the major underlying cause of secondary malnutrition. Asymptomatic masqueraders of secondary malnutrition were seen in 21 patients (2 with atrial septal defect and 6 with congenital urologic abnormalities and 13 cases of pulmonary tuberculosis). None of the patients were found to have over nutrition (overweight and obesity).

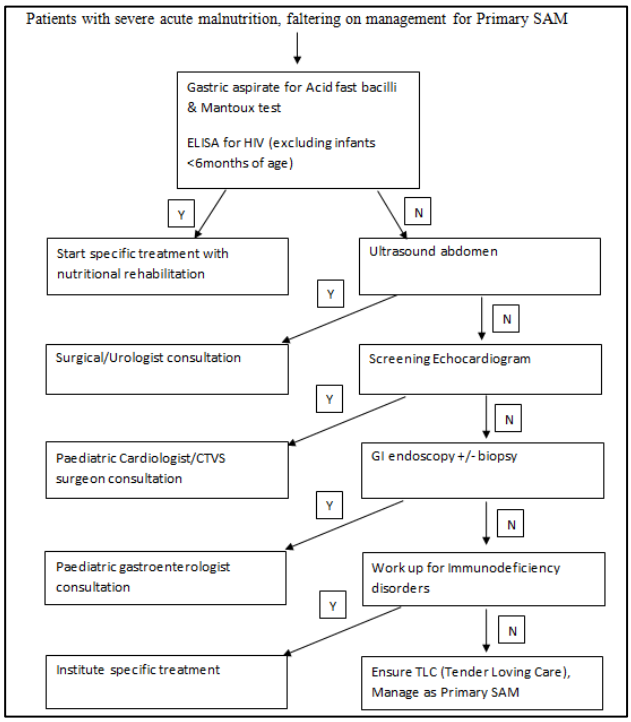

Figure 1: Algorithmic approach towards identification of asymptomatic masqueraders of secondary malnutrition.

DISCUSSION

Secondary malnutrition was seen in about one-fifth of our patients and had a varied etiological spectrum, with the major cause being central nervous system disorders followed by tropical infections.

Secondary malnutrition is well known, but use of the terminology is restricted. To the best of our knowledge, our study is the first of its kind from India, which harbours a large number of malnourished children with secondary malnutrition. Another study from Romania, compared 33 children with malnutrition due to neoplastic diseases and 25 cases with malnutrition due to other secondary causes, with 48 children having normal nutritional status, and found statistically significant results.[5]

None of the patients were found to be overweight or obese in our study, most likely since the former is more prevalent in affluent societies, while the majority of our study population belonged to the rural areas, having low socio-economic status.

To the best of our knowledge, our study is also the first of its kind, which has used an algorithmic approach to identify the asymptomatic masqueraders of secondary malnutrition. Identification and regular follow-up may help them in seeking specific medical attention early and consequently improve their nutritional status as well.

The common biochemical parameters used for assessment of nutritional state were deliberately not evaluated as they themselves are deranged in underlying systemic disorders, for instance serum albumin in hepatic causes and renal disorders.

Primary malnutrition may co-exist with secondary but it was not differentiated as would have unnecessary prolonged the hospital stay of the patient.

CONCLUSION

Secondary malnutrition is not uncommon and may occur due to pathologies of various organ systems.

ACKNOWLEDGEMENTS

Authors would like to thank Dr. Prabha Verma, junior resident, for assistance in data collection.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Bhutia DT. Protein energy malnutrition in India: the plight of our under five children. J Family Med Prim Care. 2014;3(1):63-7.
2. Shahrin L, Chisti MJ, Ahmed T. Primary and secondary malnutrition. In: Koletzko B et al editors. Paediatric nutrition in practice. World Rev Nutr Diet. 2nd edition. Basel, Karger. 2015;113:139-46.
3. WHO, UNICEF, and SCN Informal consultation on community-based management of severe malnutrition in children. Food and Nutrition Bulletin. (Supplement - SCN Nutrition Policy Paper no. 21) 2006. Available at http:// www.who.int/ nutrition/ topics/malnutrition/en/. Accessed on 26 August 2016.

4. Facility based care of severe acute malnutrition participant manual March 2011. Available at http://upnrcmis.org/ResourceMaterial/NRCTraining Manuals/Participant%20Mannual17-04-2012.pdf. Accessed on 26 August 2016.

5. Oana M, Mihaela C, Anamaria P. Assessment of nutritional status in children with secondary malnutrition versus children with adequate nutritional status. Paediatr Res. 2011;70:820-2.

Cite this article as: Chandra S, Singh DK. Secondary malnutrition: clinico-etiological spectrum. Int J Contemp Pediatr 2016;3:1445-8.