NUTRITIONAL STATUS AND MORBIDITY IN CHILDREN 0-5YEARS SEEN IN JOS UNIVERSITY TEACHING HOSPITAL

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Authors' contribution

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Abstract:
Malnutrition underlies more than 50% of childhood mortality in Nigeria. It contributes significantly to mortality rates in children less than 5years of age. Prevalent childhood illnesses beyond the neonatal period are acute respiratory infections amongst other and outcome of treatment is invariably related to nutritional status. We sought to determine the morbidity pattern and nutritional status of children 5years and below admitted into the children emergency unit without primary diagnosis of malnutrition. Consenting subjects over a one year period between 0-5years were recruited into the study. Data retrieved included age, sex, weight, length/height and mid-upper arm circumference, clinical diagnosis amongst others.

Seventy three subjects 5years and below were recruited out of 113 patients seen during the period. Mean age 21.518.5months. Most (43.8%) were infants. Acute respiratory infections (pneumonia, bronchiolitis and pharyngotonsillitis) accounted for 51.4% of admission, malaria 22.3% sickle cell anaemia 8.3% and UTI 6.1% amongst others. Malnutrition was seen in 48.9% using WHZ, 15.1% had severe acute malnutrition, 10.9% were overweight while 9.6% had severe stunting. Most cases of SAM were seen in patients with pneumonia (35.7%). Malaria had mainly subjects with MAM (60%). Over-nutrition was seen more in subjects with UTI (50%), pneumonia (28.4%), bronchiolitis (33.3%) and malaria (20%). Severe stunted was noted among subjects with pneumonia (21.4%), UTI (25%) and bronchiolitis (33.3%). Malnutrition remains an underlying co-morbidity in children 5years and below. Intensified efforts at community and clinical management of malnutrition in all children is needed

Key words: *Nutritional status, Morbidity, Children 0-5years old.*

Introduction/background

It is clearly understood that the first five years of life are very crucial to the growth and development of any child. Malnutrition impacts greatly on the mortality and morbidity from childhood illness and stands as risk for several adult onset chronic disease.[1,2]

The nutritional status of under-five children is one of the indicators of household well-being and one of the determinants of child survival and Childhood malnutrition is one of the most important causes of infant and child mortality.[3-5]

The main causes of child mortality are illnesses and conditions that can be easily prevented. Such as malaria, diarrhoeal diseases, acute respiratory tract infections (ARIs) and vaccine preventable diseases, in synergy with underlying malnutrition particularly in poor socio-economic environments.[6]

This study was designed to review the pattern of malnutrition and associated morbidities of children less than five years admitted into the emergency paediatric unit of a tertiary hospital over a one year period

Methodology

The study was conducted at the emergency paediatric unit (EPU) of the Jos University Teaching Hospital (JUTH).

This descriptive cross-sectional study was conducted over a 12 month period (January to December 2010). All consecutive children seen in the EPU during the study period except those with primary diagnosis of malnutrition were recruited into the study. This period also marked the period of repeated sectarian crisis in the region, hence poor patient turn-out.

Ethical approval was received from the hospitals' ethical committee. Informed consent was sought from care givers of all eligible children and only those who consented to participate in the study were recruited into the study.

Pre-tested semi-structured questionnaires were administered to the respondents by resident doctors during their routine work at the time of seeing the patient in the EPU.

The information obtained from the patient includes bio-data, anthropometry, and symptoms of illness. Routine and specific laboratory investigations to confirm and manage presenting diseases were carried out as per standard protocol.

Data generated was analysed using the Stata10-IC statistical software by Stata Inc, USA. Anthropometric assessment was done using the world health organization Anthro software 3.2.2. Student t test was used to compare means of grouped variable. P value of <0.05 was considered as statistically significant

Result

During the study period, a total of 113 children were admitted into the unit, out of which 64.6% (73) were children 5years and below who did not receive a primary diagnosis of malnutrition on admission, 3/113 (2.7%) were admitted for malnutrition (excluded in the analysis).

Mean age in months was 21.518.5months. Males accounted for 59% of the study population and Females 41% with a M: F ratio of 1.4: 1. The 0-11months old accounted for 43.8% (32) of the patients seen with the 6-11month old accounting for the largest group. The least was the age group 36months and above. The least in the categories were the 36-47months old (9.6%).

Major admitting diagnoses in the children 5years and below were; Acute respiratory infections 38/73 (bronchopneumonia 25, bronchiolitis 8 and tonsillitis 5) (51.4%), Malaria infection 15 (22.3%), Sickle cell anaemia (SCA) 6/73 (8.3%), Urinary tract infection (UTI) 5/73 (6.1%), and Others 13 (18.1)%. This "Others" include meningitis, nephritic syndrome, afebrile seizures etc with none accounting for 5% or more of admission.

Anthropometric Assessments

Mean weight of the subjects was 9.9±3.7kg, mean height 79.6±15.5cm, no statistical difference in weight ($p=0.9$) and height ($p=0.2$) among the sexes was seen.

Among the subjects, acute malnutrition (z score <-2) was observed in 48.9% of the subjects using weight for height Z score (WHZ).

Under nutrition (weight for age z score <-2) was noted in 24.7% of the subjects. Out of these, 15.1% (of all subjects) had severe acute malnutrition (SAM) while 9.6% had moderate acute malnutrition (MAM).

Over-nutrition (using WHZ score), was seen in 10.9% of subjects. Using BAZ score, prevalence of over-nutrition was 11%. No statistical difference between the sexes for both acute malnutrition and over-nutrition. This is shown in Table I.

Pattern of Malnutrition

The nutritional disorder seen among the various morbidities are shown in table II. In subjects with pneumonia, 14/25 (56%) had one form of malnutrition or the other. Most common were severe acute malnutrition 5/14 (35.7%) and over-nutrition 4/14 (28.6%).

Among the 5 subjects with UTI, 4 (80%) had one form of malnutrition or the other. Main form seen was over-nutrition in 2/4, and 1/4 each with SAM and severe stunting.

Of the 6 subjects in the study with Sickle cell aneamia only 1/6 had a form of malnutrition (SAM).

Bronchiolitis with 3/8 (37.5%) malnourished subjects had representation in SAM (1/3), over-nutrition (1/3) and stunting (1/3).

Discussion

About two- thirds of the children admitted during this study period were less than 5 years of age demonstrating the contribution of this age group to mortality and morbidity rates in children. This value is similar (65.3%) to that obtained by Chapp-Jumbo[7] in 2003, though less than the 83.6% reported by Obi[8] in 1979. This decline in the morbidity rate of children under the age of 5 years in our country is however slow when compared to the rate of decline in developed country with a 50% reduction.[9] This slow decline demonstrates the challenges of un- abating under 5 mortality in our environment, which directly affects our ability to attain the millennium development goal 5 (MDG 5).

Respiratory tract infections is a major contributor to hospital admissions in our setting as seen in this study, accounting for more than half (51.4%) of the cases on admission. This high prevalence of respiratory tract infections may not be unconnected with the absence of Pneumococcal as well as the Hemophilus influenza Type b (Hib) vaccine in our immunization schedule.

While not documented clearly in our environment, the impact of environmental pollution with fumes from generating sets, use of firewood in cooking and kerosene lanterns to sleep may be contributing to this high prevalence.

Other major contributor to childhood morbidity noted here is malaria with a prevalence of 22.3%. This figure is half the national malaria prevalence, and less than half of the 49% prevalence for the North- Central region of Nigeria reported in 2010.[10] This may be because most cases of malaria seen in tertiary centres are severe forms while other cases are managed on an out- patient basis and in other health facilities, but may also confirm the reported lower prevalence of malaria in Plateau state. The finding in this study is however higher than the reported 12% prevalence rate for Plateau state.[10]

Malnutrition (under- and over-nutrition) was detected in almost half (48.9%) the subjects who presented to the hospital with other illnesses, especially acute infections, rather than primary malnutrition. There is an intricate link between acute malnutrition and infections. While

Table I: Nutritional status of subjects

Category (SD)	WHZ	%	HAZ	%	WAZ	%	BAZ	%
Normal (=-1, <+2)	30	41.1	36	49.3	44	60.3	31	42.4
Mild (<-1, >-2)	17	23.3	12	16.4	11	15.1	14	19.2
Moderate (<-2)	7	9.6	10	13.7	11	15.1	8	11
Severe (<-3)	11	15.1	7	9.6	7	9.6	11	16.4
Over-nutrition (>+2)	8	10.9	8	11	2	2.7	8	11
Total	73	100.0	73	100.0	73	100.0	73	100

Table II: Pattern of malnutrition and morbidity

Nutritional Pattern	Pneumonia N (%)	Bronchiolitis N (%)	Tonsillitis N (%)	UTI N(%)	Malaria N (%)	Others N (%)	Total N (%)
S.A.M	5 (35.7)	1 (33.3)	1 (50)	1 (25)	1 (20)	2 (40)	11(33.3)
M.A.M	2 (14.3)	0 (0.0)	1 (50)	0 (0.0)	3 (60)	1 (20)	7(21.2)
Severe stunting	3 (21.4)	1 (33.3)	0 (0.0)	1 (25)	0 (0.0)	2 (40)	7(21.2)
Over-nutrition	4 (28.6)	1 (33.3)	0 (0.0)	2 (50)	1 (20)	0 (0.0)	8(24.3)
Total	14(100)	3 (100)	2 (100)	4 (100)	5 100	5 (100)	33 (100)

malnutrition increases susceptibility to infections, infections can also predispose to malnutrition in children.[11,12] There was no significant difference between the males and females which is similar to reports from other studies.[13,14]

The pattern of malnutrition seen may be significant contributor to the emergent diseases. It is reported that over 50% of childhood illnesses and mortality have underlying/associated malnutrition.[15]
Severe acute malnutrition (WHZ <-3) was observed in 15.1% of the subjects seen while severe thinness (BAZ <-3) was seen in 16.4% of the subjects (Table 2). Stunting was recorded in 9.6% of the subjects.

Disease specific malnutrition prevalence indicated that Pneumonia and UTI had significant malnutrition related co-morbidity. This high burden of malnutrition in the morbidities noted, maybe cause and effect related, with malnutrition predisposing to the seen infection and the infection causing malnutrition in their own right.

Subjects with UTI showed a high overall prevalence of associated malnutrition, 4/5 of the subjects. This high prevalence could be indicative of underlying chronic renal pathologies such as posterior urethral valves, vesico-ureteral reflux and renal scarring with attendant growth impairment and alteration.[16,17]

While under-nutrition may be the predominant picture noted in this study, over-nutrition (BAZ >+2) was noted in significant proportion of the subjects, accounting for 11% of total burden of malnutrition. This attests to the emerging burden of double malnutrition in our sub-region.

Conclusion

While subjects primarily may not present with malnutrition at onset as noted in this study, it is imperative that clinicians actively search for nutritional deviation in every child presenting to the hospital and measures at addressing the observed nutritional deviations started. Importantly also, adoption of WHZ rather than the composite WAZ in assessment of clinical nutrition should be deployed as acute changes in nutrition can easily be noted and addressed.

Limitation

The small sample size, though not intentional, limits the generalization of the findings of this study but does not over shadow the challenges of malnutrition in our region and the impact on common under-5 morbidities as seen in our environment.

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Conflict of Interest: None

Reference

1. POLICY Project/Nigeria. Child Survival in Nigeria: Situation, Response and Prospects. Key Issues. October 2002
2. Pelletier DL, Frongillo EA. Changes in child survival are strongly associated with changes in malnutrition in developing countries. J Nutr. 2003 Jan;133(1):107-119
3. Thomas D, Strauss J, Henriques MH: Child survival, height for age and household characteristics in Brazil. Journal of Development Economics 1990, 33:197-234.
4. Pelletier DL, Frongillo EA, Schroeder DG, Habicht JP: The effects of malnutrition on child mortality in developing countries. Bulletin of the World Health Organization 1995, 73(4):443-448.
5. Svedberg P: Undernutrition in Sub-Saharan Africa: A critical assessment of the evidence. World Institute for Development Economics Research, Working Paper No. 15. Helsinki: UNU/WIDER 1987.
6. Nigerian Academy of Science. Reducing child mortality in Nigeria. Workshop summary. Ed:Olumide YM, Odubanjo OM. 2009 Feb. Academy press Lagos.
7. Chapp- Jumbo AUN. Pattern of morbidity requiring admission into the children's ward of Abia State University teaching hospital, Aba. JOMIP 2003;4: 23 25
8. Obi JO. Morbidity and mortality pattern of children under 5 years old in a Nigerian hospital. Journal Of The National Medical Association 1979; 71(3): 245 - 247
9. World Health statistics 2010. World health organization
10. National Population Commission (NPC) [Nigeria], National Malaria Control Programme (NMCP) [Nigeria], and ICF International. 2012. Nigeria Malaria Indicator Survey 2010.
11. Scrimshaw MS, Taylor CE, Gordon JE. Interactions of nutrition and infections. WHO monograph series 1968; 57:216257
12. Beisel WR. Nutrition and immune function: overview. J Nutr1996; 126 (Suppl):2611-2615.
13. Ubesie AC, Ibeziako NS, Ndiokwelu CI et al. Under-five Protein Energy Malnutrition admitted at the University of In Nigeria Teaching Hospital, Enugu: a 10 year retrospective review. Nutrition Journal 2012, 11:43
14. Cartmell E, Natalal H, Francois I, Ferreira MH, Grahnquist L: Nutritional and Clinical Status of Children Admitted to the Malnutrition Ward, Maputo Central Hospital: A Comparison of Data from 2001 and 1983. J Trop Pediatr 2005, 51(2):102105.
15. UNICEF. Maternal and Child health. www.unicef.org/nigeria/children_1927.html. accessed June 7, 2012
16. Allah BG and Arshad HL. Urinary Tract Infection as a Predictor of Childhood Malnutrition in Southern Sindh, Pakistan. 2010 Pakistan Journal of Nutrition, 9: 819-821.
17. Uthup S, Binitha R, Geetha S, Hema R, Kailas L A follow-up study of children with posterior urethral valve. 2010 Apr. Indian J Nephrol, 20(2):72-75