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Brief Communication

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Prevalence of nutritional deficits among children under five years of age in Angola

ABSTRACT

OBJECTIVE: To estimate the prevalence of nutritional deficiencies in Angolan children.

METHODS: A cross-sectional population based study. World Health Organization (2006) criteria were used to classify nutritional state.

RESULTS: A high prevalence of low height for age, weight for height and weight for age was observed (22%, 13% and 7%, respectively) among the children.

CONCLUSIONS: Nutritional deficiencies in children represents a serious public health problem in Bom Jesus, Angola.

DESCRIPTORS: Infant. Child. Deficiency Diseases, epidemiology. Child Nutrition Disorders, epidemiology. Nutrition Surveys.

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INTRODUCTION

The worldwide prevalence of nutritional deficiencies in children under five has decreased, although to differing extents between countries, due to exposure to unfavorable socio-environmental conditions in less developed regions.[1]

It is estimated that worldwide, in 2010, 115 million children under five were underweight for their age (W/A). Higher prevalence was found in the Center-South region of Asia (30%) and in East, West and Central Africa, 22%, 22% and 21% respectively.[1] In the same year, around 178 million children under five had low height for their age (H/A). This deficit may compromise development and cognitive ability when it affects a child under two, leading to lower productivity and human capital in adulthood.[1]

Children with nutritional deficiencies are more prone to serious infections and death from diarrhea, measles, pneumonia and malaria. Those who survive may have a weakened immune system and develop a vicious cycle of recurrent infection and malnutrition.[1] In addition, they may have impaired performance at school and are at greater risk of developing chronic illness in adulthood.[1]

Angola is a developing country in sub-Saharan Africa. Life expectancy at birth is 52 years and 34.4% of the population aged over 15 are illiterate. The socio-environmental conditions are precarious: 78.5% of the urban population live in dwellings constructed from materials not fit for the purpose, without access to electricity (59.8%), drinking water (58%) or proper sanitation (40.4%).[a] The prevalence of low H/A was 29.2% in 2007, 12% severely so. A higher prevalence was observed in the West (34.3%), South (33.7%) and Center South (31.3%). The prevalence of low weight for height (W/H) was 8.2% and for low W/A, 15.6%.[b]

Bom Jesus is a community in the municipality of Icolo e Bengo, in the province of Luanda, with rural characteristics, close to the capital. No studies were found on the prevalence of nutritional deficiencies in children under five in this area.

This study aimed to estimate the prevalence of nutritional deficiencies in Angolan children.

METHODS

A cross-sectional population-based study of 744 children aged under five in the community of Bom Jesus, province of Luanda, in 2010.

The sample was selected using the systematic sampling technique, with the household used as the sampling unit. The first household was randomly selected, and then every third household from there, in an anti-clockwise, eastern direction. Children living in the households selected were deemed to be units of analysis, excluding those who were absent, who were suffering from long-term illness and those whose data presented discrepancies.

The data were collected between May and August 2010, carried out by students in the final year of the medicine degree at the Faculty of Medicine, *Universidade Agostinho Neto*, under the supervision of a researcher.

The interviewers were trained and those who obtained the best precision in taking anthropometric measurements were scheduled to carry out the fieldwork. Weight was measured using portable Salter scales, model CMS, with a capacity of 25 kg and precise to 100 g, calibrated daily with standard weights. For children under 24 months, length was measured lying down and those aged over 24 months were measured in a supine position,[c] using portable anthropometers, model AHRTAG, precise to 1 mm. The data were collected in duplicate, with the mean used as the final value, as long as the difference between measurements was < 100 g for weight and 0.7 cm for height.[2]

The interviews were conducted preferably with the child's mother or guardian. A structured, previously codified questionnaire was applied, which included data about the child: age, sex, date of birth, birth weight, birth order and morbidity in the preceding 15 days.

Nutritional status was calculated according to the anthropometric indices H/A, W/H and W/A and expressed in Z scores (Z), carried out using the WHO Anthro program version 3.1.0, using World Health Organization growth curves[2] for children under five as a standard of reference, the cutoff point considered was -2 Z. Thirty-four children were excluded: 2.2% as they were absent during the data collection period, 0.9% due to long term illness and 1.3% for having extreme Z values, i.e., W/A < - 6 or > 5; H/A < - 6 or > 6; and W/H < - 5 or > 5.

The EpiInfo program version 3.5.1 was used to compare deficiencies according to the characteristics of the children. Pearson's Chi-squared test was used to test heterogeneity, with the level of significance of 0.05.

The research was approved by the Provincial Health Care directorate of Bengo, Angola (Process No. 26/DPSB/2009); by the Independent Ethics Committee of the Faculty of Medicine, *Universidade Agostinho Neto*,

[a] Instituto Nacional de Estatística. Inquérito integrado sobre o bem estar da população 2008-09. Luanda; 2010.
[b] Ministério da Saúde. Relatório do inquérito sobre a nutrição em Angola. Luanda; 2007.
[c] World Health Organization. Training course on child growth assessment. Geneva; 2008 [cited 2009 Sept 20]. Available from: http://www.who.int/childgrowth/training/en/

Angola; and by the Research Ethics Committee of the *Centro de Saúde-Escola* of the Faculty of Medicine, of Ribeirao Preto, *Universidade de São Paulo*, (Process No. 267/09/COORD. CEP/CSE-FMRP-USP).

After clearing up any doubts, the children's mothers or guardians agreed to participate in the study and signed a informed consent form. Those children who had nutritional deficiencies or other morbidities received advice and were referred to the local health care service for treatment and monitoring.

RESULTS

In 2010 there were 2,088 households in the community of Bom Jesus. There were 696 (around ⅓) randomly

Table. Prevalence of nutritional deficiencies according to characteristics of children aged under five. Bom Jesus, Angola, 2010.

Variables/characteristics	n	Low H/A (≤ 2 Z)	Low W/H (≤ 2 Z)	Low W/A (≤ 2 Z)
Total	744	22.0	6.6	13.3
Sex				
Male	339	25.1	6.5	15.6
Female	405	19.5	6.7	11.4
p[a]		0.068	0.923	0.087
Age group (months)				
0 to 5	90	5.6	11.1	4.4
6 to 11	81	16.0	7.4	11.1
12 to 23	178	25.3	10.1	20.8
24 to 35	138	30.4	2.9	12.3
36 to 47	139	26.6	2.2	12.2
48 to 59	118	18.6	6.8	12.7
p[a]		< 0.001	0.015	0.009
Birth weight				
SI	253	21.7	4.3	13.4
< 2,500	21	38.1	9.5	19.0
≥ 2,500	470	21.5	7.7	13.0
p[a]		0.197	0.198	0.720
Birth order				
1st	170	13.5	6.5	8.8
2nd	183	29.0	7.7	18.8
3rd or 4th	246	22.8	8.1	13.8
5th or 6th	95	25.3	3.2	15.8
≥ 7th	50	16.0	2.0	4.0
p[a]		0.748	0.604	0.824
Diarrhea with mucus/blood				
Yes	75	32.0	4.0	14.7
No	669	20.9	6.9	13.2
p[a]		0.028	0.341	0.715
Parasites				
Yes	42	38.1	9.5	28.6
No	702	21.1	6.4	12.4
p[a]		0.010	0.429	0.003
Anal itching				
Yes	140	25.7	6.4	22.1
No	604	21.2	6.6	11.3
p[a]		0.245	0.934	0.006

NI: No information; H/A: Height for age; W/H: Weight for height; W/A: Weight for agee
[a]According to the Chi-squared test for heterogeneity

selected to take part; children under five lived in 23.3% of these. In these households there were 498 families and 778 children were identified.

Among the 744 children observed, the prevalence of nutritional deficiencies was high for the three indices: 22.0%, 6.6% and 13.3% for low H/A, W/H and W/A, respectively. There was a greater proportion of children with low H/A in the 24 to 35 months age group, whereas low W/H and W/A were more prevalent in the age groups of zero to five months and 12 to 23 months, respectively. A higher prevalence of low H/A was observed in children with diarrhea containing mucus and blood, and parasites, whereas the proportion of low W/A was higher in those who reported passing parasites and anal itching (Table).

DISCUSSION

A high prevalence of nutritional deficiency was observed among the children in the community of Bom Jesus, posing a serious public health problem.

Low H/A continues to be the most common worldwide, compared with low W/H and W/A.[1] Although Bom Jesus has rural characteristics, the prevalence of low H/A (22%) was lower than that verified in rural Angola (33.0%) and in the province of Bengo,[b] probably due to the establishment of industries, which may have led to an increase in household income. A higher prevalence of low H/A was observed from two years old onwards, with the greatest proportion in the 24 to 47 month old age group. Low H/A indicates a chronic condition due to a continuous process of malnutrition at a young age. Maternal malnutrition, which can lead to low birth weights, and poor nutrition for young and breastfeeding children are some of the causes of malnutrition in the early years.[1]

Although the prevalence of low W/A in Bom Jesus was considered high (13.3%), it was lower than that found in rural Angola (18.0%).[b] A third of children aged six to 23 months have acute malnutrition, which may be a reflection of maternal malnutrition, insufficient nutrition from breastfeeding and precarious food situations, especially at the time of weaning.[1]

Illiteracy, especially on the part of the mother, and precarious environmental, sanitary and social conditions may be subjacent causes of the link between low H/A and W/A and intestinal parasites and diarrhea, immediate causes of infant malnutrition.[1] A high proportion of households in Bom Jesus, in 2010, lived in one-roomed homes constructed of material which is unfit for the purpose, without access to treated water. There was no toilet/sewer and rubbish was dumped in the open air in more than ⅔ of households. Approximately ⅔ of mothers were illiterate or had between one and four years of schooling (data not shown).

Although the results cannot be extrapolated to all Angolan children, the findings show an elevated prevalence of nutritional deficiencies, especially with regards to low H/A. Other studies are necessary to identify the determinants of infant malnutrition with the aim of establishing preventative measures.

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The authors declare that there are no conflicts of interest.