Jornal de

Pediatria

www.jped.com.br

ORIGINAL ARTICLE

Prevalence and factors associated with vitamin A deficiency in children and adolescents ☆

Rita de Cássia Ribeiro-Silva *, Itaciara L. Nunes, Ana Marlúcia Oliveira Assis

School of Nutrition, Post-Graduation Program in Food and Nutrition, Department of Nutritional Sciences, Universidade Federal da Bahia (UFBA), Salvador, BA, Brazil

Abstract
Objective: To identify the prevalence and factors associated with vitamin A deficiency (VAD) in children and adolescents.
Methods: This was a cross-sectional study involving 546 schoolchildren, aged between 7 and 14 years, of both genders, enrolled in public elementary schools. Blood was collected for measurement of serum retinol. The retinol concentration in the samples was determined by high performance liquid chromatography (HPLC). Data were collected on anthropometrics, dietary, demographic, and socioeconomic factors. Polytomous logistic regression was used to evaluate the associations of interest.
Results: Approximately 27.5% of the students had retinol values < 30 μg/dL. The multivariate analysis showed, after the appropriate adjustments, a positive and statistically significant association of moderate/severe VAD (OR = 2.19; 95% CI 1.17 to 4.10) and marginal VAD (OR = 2.34; 95% CI 1.47 to 3.73) with age < 10 years. There was also association of VAD moderate/severe (OR = 2.01; 95% CI 1.01 to 5.05) and borderline VAD (OR = 2.14; 95% CI: 1.08 to 4.21) with the anthropometric status of underweight. Lower intake of retinol was detected among those with severe VAD.
Conclusion: VAD is a health concern among children and adolescents. Lower weight and younger schoolchildren had greater vulnerability to VAD.
© 2014 Sociedade Brasileira de Pediatria. Published by Elsevier Editora Ltda.
Este é um artigo Open Access sob a licença de CC BY-NC-ND

---

* Corresponding author.
E-mail: rcrsilva@ufba.br (R. de Cássia Ribeiro-Silva).

PALAVRAS-CHAVE
Deficiência de
vitamina A;
Fatores de risco;
Crianças;
Adolescentes

Prevalência e fatores associados à deficiência de vitamina A em crianças e adolescentes

Resumo

Objetivo: Identificar prevalência e fatores associados à deficiência de vitamina A (DVA) entre crianças e adolescentes.

Métodos: Estudo transversal envolvendo 546 escolares, com idade entre 7 e 14 anos, de ambos os sexos, matriculadas na rede pública do ensino fundamental. O sangue foi coletado para dosagem dos níveis séricos de retinol. A concentração de retinol das amostras foi determinada pelo método da cromatografia líquida de alta eficiência (CLAE). Coletaram-se dados antropométricos, alimentares, demográficos e socioeconômicos. Utilizou-se da regressão logística politômica para avaliar as associações de interesse.

Resultados: Aproximadamente 27,5% dos estudantes apresentaram valores de retinol < 30 μg/dL. Em análise multivariada, verificou-se, após devidos ajustes, associação positiva e estatisticamente significante da DVA moderada/grave (OR = 2,19; IC 95%: 1,17-4,10) e da DVA marginal (OR = 2,34; IC 95%: 1,47-3,73) com a idade < 10anos. Verificou-se, igualmente, associação da DVA moderada/grave (OR = 2,01; IC 95%: 1,01-5,05) e DVA marginal (OR = 2,14; IC 95%: 1,08-4,21) com o estado antropométrico magreza. Menor consumo de retinol foi detectado entre aqueles com DVA grave.

Conclusão: A deficiência de vitamina A configura-se como um problema de saúde preocupante entre os escolares e adolescentes. Constatou-se maior vulnerabilidade dos escolares de baixo peso e mais jovens à DVA.

Introduction

Vitamin A deficiency (VAD) is a nutritional deficiency of high magnitude that can be caused by insufficient intake of vitamin A food sources or by vitamin absorption, transport, or metabolism problems. The importance of adequate vitamin A nutritional status is indisputable, as it has very diverse physiological roles in the visual process, in the integrity of epithelial tissue and immune system, as well as in other metabolic functions.[1]

VAD specifically affects populations subjected to poor living conditions, in addition to other factors related to morbidity conditions that also contribute to serum retinol depletion. Among them are infections that increase the necessity or stimulate endogenous losses of this nutrient, and protein-energy malnutrition, which affects the synthesis of retinol binding protein (RBP), thereby decreasing retinol availability.[2]

Children at preschool age, pregnant women, and nursing mothers are regarded as the classic risk group. However, studies have indicated other possible risk groups for the deficiency; among these are children and adolescents. Since it is involved in growth and physical development, vitamin A also becomes essential at this stage.[1,3] The results of the few studies available in the Brazilian literature generally indicate that VAD prevalence ranges from 6.8% to 34.0% in this population.[3]

Since they are not classically considered as a risk group, there are not many studies on vitamin A nutritional status in schoolchildren (including adolescents), which has prevented a proper assessment of the actual magnitude of VAD in this age group in Brazil. Therefore, the present study aimed to estimate the prevalence of VAD and associated factors in children and adolescents enrolled in public schools in the city of Salvador, state of Bahia, Brazil.

Methods

This was a cross-sectional study involving students of both genders, aged 7-14 years. Participants were identified from a broader study that aimed to identify factors associated with iron-deficiency anemia in children and adolescents enrolled in public schools in the city of Salvador.[4]

The original study sampling procedure involved a complex study design, considering the stratification of schools at two levels (state and municipal), followed by cluster sampling procedure in three phases: the first phase assessed the health districts; the second, the schools; the third, the students. Due to logistical field issues, the information on the selected students was obtained from six of the 12 existing districts in Salvador, a city that has 117 state and 173 municipal schools. The state schools had 58,059 students; the municipal schools, 56,555. To meet the previously defined sample size, it was necessary to select ten students from each of the 58 municipal schools and 23 students from each of the 27 state schools, totaling 1,200 students.

A total of 600 students were randomly selected for this study, corresponding to 50% of the original sample. Considering that this sample was not estimated to investigate the object used in this study, it was decided to retrospectively calculate the sampling error. In these circumstances, and