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Prevalence and risk factors of anemia in children[☆],[☆☆]

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Abstract

Objective: To identify the prevalence and factors associated with anemia in children attending Municipal Early Childhood Education Day Care Center (Centros Municipais de Educação Infantil [CMEI]) nurseries in Colombo-PR.

Methods: Analytical, cross-sectional study with a representative sample of 334 children obtained by stratified cluster sampling, with random selection of 26 nurseries. Data collection was conducted through interviews with parents, assessment of iron intake by direct food weighing, and hemoglobin measurement using the finger-stick test. Bivariate association tests were performed followed by multiple logistic regression adjustment.

Results: The prevalence of anemia was 34.7%. Factors associated with anemia were: maternal age younger than 28 years old ($p = 0.03$), male children ($p = 0.02$), children younger than 24 months ($p = 0.01$), and children who did not consume iron food sources (meat + beans + dark green leafy vegetables) ($p = 0.02$). There was no association between anemia and iron food intake in CMEI. However, iron intake was well below the recommended levels according to the National Education Development Fund resolution, higher prevalence of anemia was observed in children whose intake of iron, heme iron, and nonheme iron was below the median.

Conclusions: In terms of public health, the prevalence of anemia is characterized as a moderate problem in the studied population and demonstrates the need for coordination of interdisciplinary actions for its reduction in CMEI nurseries.

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Prevalência e fatores de risco da anemia em crianças

Resumo

Objetivo: Identificar a prevalência e os fatores associados à anemia em crianças que frequentam berçários de Centros Municipais de Educação Infantil (CMEI) de Colombo-PR.

Métodos: Estudo analítico, de caráter transversal, com amostra representativa de 334 crianças obtida por amostragem estratificada por conglomerados, com seleção aleatória de 26 berçários. A coleta de dados foi realizada por meio de entrevista com os pais, avaliação da ingestão de ferro por pesagem direta de alimentos e dosagem de hemoglobina por punção digital. Foram realizados testes de associação bivariados seguido pelo ajuste de uma regressão logística múltipla.

Resultados: A prevalência de anemia foi de 34,7%. Os fatores associados à anemia foram: idade materna inferior a 28 anos (p = 0,03), crianças do sexo masculino (p = 0,02), com idade inferior a 24 meses (p = 0,01) e que não consumiam fontes alimentares de ferro (carne+feijão+verduras verdes escuras) (p = 0,02). Não houve associação entre anemia e ingestão de ferro no CMEI. Porém, a ingestão de ferro foi bem abaixo do que recomenda a resolução do Fundo Nacional de Desenvolvimento da Educação, sendo possível observar maior prevalência de anemia nas crianças cuja ingestão de ferro, ferro heme e ferro não-heme apresentava-se abaixo da mediana.

Conclusão: Em termos de saúde pública, a prevalência de anemia encontrada se caracteriza como um problema moderado na população estudada e demonstra a necessidade de articulação de ações interdisciplinares para a sua diminuição nos CMEIs.

Introduction

Anemia is a global public health problem, with important consequences for human health and the social and economic development of each nation.[1] It results from single or multiple causes that act simultaneously, influencing children's health,[2] their cognitive and physical development, and immunity, increasing the risk of infections and infant mortality.[3]

A global analysis of the prevalence of anemia worldwide has shown that preschool-age children are the most affected age range, with a prevalence rate of 47.4%.[1]

Due to its complex and difficult-to-control characteristics, several studies have sought to identify the reasons for its high prevalence and potential associated factors.[4,5,6] The identification of these factors contributes to implementation of actions aimed at the prevention and minimization of the problem.

The period between conception and 2 years of age is a critical stage of development, making children vulnerable to anemia. At this age, they start attending Early Childhood Education Day Care Center nurseries, which are responsible for their full-time health and nutrition care.

The municipality of Colombo and the metropolitan region of Curitiba lack studies on the prevalence of anemia in children attending Municipal Early Childhood Education Day Care Centers (Centros Municipais de Educação Infantil [CMEI]). Thus, such studies are justified due to the greater vulnerability of these children and the identification of amounts of iron supplied in the meals at these institutions. Obtaining a profile of anemia status may contribute to the implementation and consolidation of actions that will contribute to its prevention and reduction in this population.

The objective of the study was to estimate the prevalence of anemia and to identify associated factors in children attending CMEI nurseries in the municipality of Colombo, state of Parana, Brazil.

Material and methods

This is a cross-sectional analytical study of 334 children aged 6–36 months, attending CMEI nurseries the city of Colombo – PR, in the metropolitan region of Curitiba. Colombo has 38 CMEIs, attended by 6852 children regularly enrolled in 2012, with 816 in the nurseries.

The selected sample was representative of children from CMEI nurseries and was defined by stratified cluster sampling with a single step, with random selection of 26 of the 38 CMEIs in Colombo. These were separated by city health district according to their location, while respecting the proportion of students enrolled in each health district. As a reference to calculate the sample, a prevalence of anemia of 29.7% was adopted from a study carried out in CMEI nurseries of Cascavel, state of Parana, with a representative sample of children between 6 and 24 months,[7] as the children are of the same age and also attend CMEIs. A confidence level of 95% was used, with a margin of error of 0.04 and an estimated proportion used as reference of 0.3. Because stratified cluster sampling was used, a 1.4 effect factor of sample design was included to guarantee the desired accuracy, resulting in a minimum sample of 320 children.