

Abstract

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Micronutrient Deficiencies Are Associated with Impaired Immune Response and Higher Burden of Respiratory Infections in Elderly Ecuadorians.

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BACKGROUND: The proportion of the Latin American population above age 65 y is expected to rise substantially.

OBJECTIVE: To better define the prevalence of infectious diseases and micronutrient deficiencies, assess immunological status, and evaluate associations between nutritional status and infection, we performed a cross-sectional study of elderly Ecuadorians in a low-income peri-urban community in Quito, Ecuador.

METHODS: Culturally adapted questionnaires, delayed type hypersensitivity (DTH) skin response, micronutrient, and immunological assays were performed in randomly selected Ecuadorians aged ≥ 65 y. Multiple linear and logistic regression models were developed to assess relationships between micronutrient concentrations and history of infection, DTH, and immune function.

RESULTS: Participants ($n = 352$; mean age \pm SD, 74.4 ± 6.4 y) recalled recent episodes of colds/influenza-like syndromes (62.8%), cough (61.0%), urinary tract infection (37.9%), diarrhea (32.2%), fever (24.1%), and pneumonia (3.5%). A prospective substudy of respiratory infections (RI) in 203 elderly revealed similar findings. Colds and pneumonia occurred in 42.8 and 7.9% of participants, respectively, during 737 person-weeks of observation (3.6 ± 1.1 wk per person). Anemia and micronutrient deficiencies, especially for vitamins C, D, B-6, and B-12 and folic acid and zinc, were common. Plasma vitamin C was associated with interferon-gamma (IFN γ) ($P < 0.01$) and zinc with IFN γ and interleukin-2 (each $P < 0.0001$). RI history was associated with any micronutrient deficiency ($P < 0.001$).

CONCLUSION: The burden of infectious diseases, micronutrient deficiencies, and anemia was substantial in this elderly Ecuadorian population. Deficiencies of essential vitamins and minerals place these elderly adults at risk for infections through their negative impact on immune function.

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