

Vitamin A supplementation and other predictors of anemia among children from Dar Es Salaam, Tanzania

[The American journal of tropical medicine and hygiene](#) 62(5):590-7; 2000

DOI: [10.4269/ajtmh.2000.62.590](#)

[PubMed](#)

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Abstract

The associations of hemoglobin, hematocrit, and packed cell volume with socioeconomic factors, malaria, human immunodeficiency virus (HIV) infection, and nutritional status were examined among 687 children admitted to hospital with pneumonia participating in a double blind, placebo-controlled trial of vitamin A supplementation. Children were randomized to receive 2 doses of vitamin A (200,000 IU) or placebo at baseline, and additional doses at 4 and 8 months after discharge from hospital. Hemoglobin levels were measured at enrollment and, on a subset of 161 children, during follow-up. At baseline, hemoglobin concentration was positively associated with the number of possessions in the household, maternal level of education and quality of water supply, and inversely related to malaria infection after controlling for potential confounding variables. Children infected with HIV experienced a significant fall in mean hemoglobin levels over time. The risk of developing severe anemia (< 7 g/dL) during follow-up was lower for children who were breastfed for longer than 18 months as compared to those with less than 6 months of breastfeeding (adjusted prevalence ratio = 0.14, 95% confidence interval [CI] = 0.02, 0.93; $P = 0.04$), and higher for children over two years of age as compared to 6 to 11 months-old infants (adjusted prevalence ratio = 8.11, 95% CI = 1.2, 55.8; $P = 0.03$). Children with repeated diagnoses of malaria had 4.1 times the risk of developing severe anemia than did children without the diagnosis (95% CI = 1.3, 13.5; $P = 0.02$). Vitamin A supplements were associated with an overall nonsignificant reduction of 14% in the risk of developing severe anemia (adjusted prevalence ratio = 0.86, 95% CI = 0.37, 1.99; $P = 0.73$). We conclude that malaria, HIV infection, low socioeconomic status, and short duration of breastfeeding are strong and independent determinants of adverse hematologic profiles in this population.