

Abstract

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Only a small proportion of anemia in northeast Thai schoolchildren is associated with iron deficiency.

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BACKGROUND: Iron deficiency is assumed to be the major cause of anemia in northeast Thailand, but other factors may be involved.

OBJECTIVE: We determined the prevalence of anemia among schoolchildren in northeast Thailand and the role of hemoglobinopathies, selected micronutrient deficiencies, and other factors in hemoglobin status.

DESIGN: Blood samples were collected from 567 children aged 6-12.9 y attending 10 primary schools for the determination of a complete blood count and hemoglobin type [Hb AA (normal hemoglobin), Hb AE (heterozygous for Hb type E), and Hb EE (homozygous for Hb type E)] and the measurement of serum ferritin, transferrin receptor, retinol, vitamin B-12, and plasma and erythrocyte folate concentrations. Children with a C-reactive protein concentration ≥ 10 mg/L ($n = 12$), which indicated infection, were excluded.

RESULTS: The prevalence of anemia was 31%. Age, hemoglobin type, and serum retinol were the major predictors of hemoglobin concentration. Hb AA and Hb AE children with anemia had lower ($P < 0.01$) hematocrit, mean cell volume, and serum retinol values than did their nonanemic counterparts; no significant differences in serum ferritin were found by hemoglobin type. Only 16% ($n = 22$) of the anemic Hb AA and Hb AE children were iron deficient. Hb AA and Hb AE children with a serum retinol concentration < 0.70 micromol/L ($n = 14$) had a significantly higher geometric mean serum ferritin concentration than did those with a retinol concentration ≥ 0.70 micromol/L ($P = 0.009$); no significant difference in transferrin receptor concentrations was found between these 2 groups.

CONCLUSIONS: Hemoglobinopathies, suboptimal vitamin A status, and age were the major predictors of hemoglobin concentration. The contribution of iron deficiency to anemia was low, and its detection was complicated by coexisting suboptimal vitamin A status.

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