

A Randomized Trial Using Iron Fortification, Anthelmintic Treatment, and Intermittent Preventive Treatment of Malaria for Anemia Control in African Schoolchildren

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Dr. Fabian Rohner, GAIN Global Alliance for Improved Nutrition, Geneva

Anemia is common among children in sub-Saharan Africa and its etiology is multifactorial. Likely causes of anemia are low bioavailability of dietary iron, malaria, and helminth infection. This study aimed to assess the effect of iron fortification, intermittent preventive treatment (IPT) of malaria, and anthelmintic treatment on hemoglobin concentration and anemia prevalence among school children. The study was a 6-month randomized, double-blind, controlled trial enrolling 591 6-12 year old school children in Côte d'Ivoire using (i) iron-fortified biscuits providing an additional 20 mg iron/day as electrolytic iron four times/week; (ii) IPT of malaria with sulfadoxine-pyrimethamine at 0 and 3 months; and (iii) anthelmintic treatment at 0 and 3 months as the interventions. Prevalence of anemia, iron deficiency, malaria parasitemia, and helminth infection was 70.4%, 9.3%, 57.7%, and 54.8%, respectively. Iron fortification did not improve iron status, IPT of malaria did not show an effect on malaria burden, and neither had an impact on anemia prevalence. Anthelmintics significantly reduced the burden of helminth infections and decreased anemia prevalence (odds ratio 0.4, 95% CI 0.3, 0.7). The low prevalence of iron deficiency and an extended dry season that decreased malaria transmission likely reduced the potential impact of iron fortification and IPT. In this setting, anthelmintic treatment was the only intervention that modestly decreased rates of anemia.

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