

## Nutrition News for Africa

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Report of the World Health Organization Technical Consultation on Prevention and Control of Iron Deficiency in Infants and Young Children in Malaria-Endemic Areas (Lyon, France, 12-14 June 2006). *Food and Nutrition Bulletin*, volume 28, number 4, pages S489-S631, 2007.

### Introduction

The World Health Organization (WHO) convened a Technical Consultation to discuss the findings of two large, community-based, randomized, controlled trials designed to evaluate the impact of iron plus folic acid supplementation on morbidity and mortality of young children (1, 2). One trial was conducted in Zanzibar, where malaria transmission is intense and occurs year-around, and the other in Nepal, where exposure to malaria is low. Findings confirmed that the iron supplementation is effective for reduction of iron deficiency and anemia in iron-deficient children. However, in Zanzibar routine iron-folic acid supplements given with or without zinc resulted in an increased rate of severe adverse events (hospitalization and mortality) in children.

The objective of the Consultation was to review the scientific evidence on the safety and efficacy of different ways of administering iron to control iron deficiency and iron-deficiency anemia, and to provide guidance on the safest, most feasible, and most effective ways of delivering additional iron to control iron deficiency in infants and young children in malaria-endemic areas.

### Conclusions of WHO Consultation

The Consultation reached consensus on several important issues related to providing additional iron to infants and young children in malaria-endemic areas. In particular, strategies to control iron deficiency in malaria-endemic regions should be carried out in the context of comprehensive and effective health care, including the provision of insecticide-treated bed nets and vector control for the prevention of malaria, and prompt recognition and treatment of malaria and its complications with effective antimalarial and antibiotic drug therapy. Measures to control iron deficiency should also include the control of other prevalent parasitic diseases and infections, delayed cord clamping and the promotion of exclusive breastfeeding for the first 6 months of life, followed by consumption of nutrient-dense and/or processed, fortified complementary foods.

Universal iron supplementation (use of medicinal iron as pills or syrups) should not be implemented without the screening of individuals for iron deficiency, because this mode of iron administration may cause severe adverse events in iron-sufficient children.

The safety of iron preparations administered through point-of-use fortification of complementary foods for infants and young children, i.e. powders, crushable tablets, and fat-based spreads, is uncertain in malaria-endemic regions. Although there is reason to believe that these preparations may be safer than iron supplements, they cannot be recommended until this assumption has been confirmed.

One option would be to administer additional iron to infants and young children as processed complementary foods fortified with iron. Although the safety of their use has not been documented, this approach would avoid the potential adverse effects of a large bolus of iron taken in a single dose, since the iron would be consumed in smaller amounts throughout the day and therefore absorbed more slowly.

Because widespread folate deficiency is not known to be a problem in infants and young children, and supplemental folic acid may interfere with the efficacy of antifolate antimalarial drug therapy, supplemental folic acid or food fortified with folic acid should not be given to infants and young children in areas where antifolate antimalarial drugs are used.

### **Program and Policy Implications**

Iron deficiency and iron deficiency anemia are common in young children, and provision of additional iron to infants and young children who are iron deficient should be a public health priority. However, in malaria-endemic regions, and possibly other areas of the world as well, precautions are required to ensure that: 1) iron supplements (including point-of-use fortification products) are only given to iron deficient children, or 2) iron is provided in small doses distributed over the day in processed complementary foods. Any iron supplementation program in malaria-endemic areas has to be well integrated into health programs to prevent and treat malaria and other common infectious diseases.

### **NNA Editors' comments\***

The Lyon conference focused only on the issue of adverse effects of iron in malaria-endemic regions, which includes most of sub-Saharan Africa. There is also evidence from studies in non-malaria endemic regions that iron supplementation of iron-sufficient children can increase the risk of infections and restrict children's growth in such settings (3, 4). Thus, possible risks and benefits of iron supplementation must be considered in relation to underlying iron status in all settings, not just malaria-endemic regions. Furthermore, it is important to note that the adverse effects of iron detected in the Zanzibar study appeared to be specific to iron status, and were not directly related to anemia. Thus, measurement of hemoglobin concentration should not be used as a proxy for assessing iron status for making decisions about the use of iron supplements. Rather, iron status should be measured directly, using indicators like serum ferritin or red blood cell protoporphyrin.

\*Note that the comments have been added by the editorial team and are not part of the cited publication.

### **References**

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