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Overcoming technical and practical barriers – treatment and prevention of iron deficiency in children: new approaches

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Children who have iron deficiency anemia in infancy are at risk for long-lasting developmental disadvantage as compared to their peers with better iron status. Primary prevention is the key goal for children. Because children are not small adults, strategies that work for adults, including commodity fortification and food diversification, are not likely to work in children, especially in infants and young children. Supplementation (either targeted or blanket-approach) is likely more suitable for infants and young children. Supplementation choices currently available include tablets (unsuitable for young children) or capsules (suitable for delivery of high dose supplements, but impractical for daily use). Intravenous or intramuscular iron is possible but has been associated with iron overload, anaphylaxis, infection and death and is thus unsuitable for general use. Liquids or syrups of iron have been used for many years, yet compliance is low because of its unpleasant taste, teeth staining, measurement difficulties and the potential for overdose. Nevertheless, drops under controlled conditions are efficacious in the treatment of anemia. We have recently demonstrated that a single daily dose of iron is equivalent in its effect on the successful treatment of anemia compared to the gold standard, three-times-per-day dose. Dissolvable tablets (fizzy tablets that dissolve in liquids), a new approach, are currently being developed by the WHO office of Child and Adolescent Health. They are undergoing ongoing testing. Perhaps the most important characteristic of a supplement program is its sustainability. Components of a sustainable supplement program include a supplement that is inexpensive to produce; simple to distribute; easy to ingest (not too large and acceptable taste); few if any side effects and proof that its regular use prevents or treats the deficiency. Our group has recently developed and tested a new form of iron, powdered microencapsulated ferrous fumarate, and a new delivery system: a single-dose sachet. The powdered iron can be added directly to any semi-liquid food. Other micronutrients, like ascorbic acid, zinc and vitamin A can be included in the sachet. Advantages of the coated 'sprinkles' are: they can be added directly to food without changing the taste or consistency of the food; easy to use (no literacy needed); lightweight and easy to store and transport; inexpensive and low tech to manufacture; inadvertent poisoning is unlikely and virtually any micronutrient can be added. We have demonstrated, in randomized controlled trials in Ghana and a pilot study in India, that the iron "sprinkles" are as efficacious as the gold standard, iron drops, for the treatment of anemia. Sprinkles may be one way to overcome technical barriers, but more than one approach is needed to successfully eliminate micronutrient deficiencies. Supported from a grant from USAID's OMNI Research Program through the Human Nutrition Institute (HNI) of ILSI.