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Home-fortification using sprinkles containing 12.5 mg of iron successfully treats anemia in Ghanaian infants and young children

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Background: The current WHO/UNICEF recommended daily dose of iron for program settings where the prevalence of anemia is greater than 40% is 12.5 mg of iron (based on ferrous sulfate), for infants and young children from 6-24 months of age. Sprinkles are a new multiple micronutrient approach to home-fortification of complementary foods for children containing iron as microencapsulated ferrous fumarate. The dose of iron in Sprinkles should be large enough to treat anemia within a relatively short period of time yet be safe for prophylactic use in non-anemic children. **Objective:** To evaluate and compare the initial hematologic response from three different doses of Sprinkles, and two forms of iron compared to the reference standard (ferrous sulfate drops) in anemic infants 6-18 months of age. **Design:** 133 anemic infants (Hb 70-100 g/L), 6-18 months of age were randomized to one of 5 groups: (1) 12.5, (2) 20, or (3) 30 mg Fe in the form of microencapsulated ferrous fumarate Sprinkles; or (4) 20 mg Fe in the form of ferric pyrophosphate Sprinkles; or (5) 1 mL ferrous sulfate drops equivalent to 15 mg Fe as the positive control group. Hemoglobin, ferritin and transferrin receptor were measured after 3 weeks and at the end of the intervention at 2 months to assess change in iron status.

Results: Mean Hb concentration increased significantly in all groups from baseline to 3 weeks and end of the intervention period ($p < 0.0001$). There was no effect of dose on final hemoglobin response. Successful treatment of anemia (Hb > 100g/L) occurred in 56%, 58%, and 65% of children in the 12.5, 20, and 30 mg ferrous fumarate Sprinkles groups, respectively; 60% in the 20 mg Fe ferric pyrophosphate Sprinkles group; and 66% in the ferrous sulfate drops group. Adherence was higher in the Sprinkles groups (90%) compared to the drops group (69%). **Conclusion:** Sprinkles provided at a dose of 12.5 mg Fe as microencapsulated ferrous fumarate provides an adequate amount of absorbable iron to improve the iron status of anemic infants within a short intervention period. This dose is in accordance with current WHO/UNICEF recommendations for program settings. Favorable adherence may promote the acceptability and effectiveness of Sprinkles as an alternative to drops in children.