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Comparison of dosing frequency and safety of micronutrient sprinkles on iron status in preschool children in northern China

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Adherence to iron supplementation has been disappointing in unsupervised settings. Evidence suggests that in supervised settings, such as in schools, intermittent dosing may be as efficacious as daily dosing. Sprinkles containing iron and other micronutrients can easily be added to school meals. **Aims:** (1) To determine whether Sprinkles given once/week would yield similar increases in hemoglobin (Hb) and ferritin (Fn) as Sprinkles given 5-days/week; (2) To explore whether a 30mg Fe dose would be safe to administer to preschool children. **Methods:** A 3-arm RCT using cluster randomization was conducted in a preschool in Northern China. 386 children ages 3-6 yrs, in 16 classes were enrolled. Classes were randomized to receive either Sprinkles for 5-days/week, or once weekly, or no intervention for 3 months. At baseline and at the end, socioeconomic and dietary variables, and Hb and Fn concentrations were determined. **Results:** Baseline characteristics between groups were similar; overall, mean Hb and geometric mean Fn concentrations were 131 ± 9 g/L and $51 \mu\text{g/L}$ (range; 2.5-155), respectively. Prevalence of anemia was only 5%. At the end, there was no significant change in Hb within or among the Sprinkles groups compared to baseline. Final mean Hb concentration was 129 ± 10 g/L in the 5-days/week regimen; 128 ± 9 g/L in the once/week regimen; and 127 ± 8 g/L in the control. There was a greater increase in Fn in the 5-days/week group compared to the once/week group ($p=0.0056$). Geometric mean Fn concentration at the end was 75mg/L (range; 27-189) in the 5-days/week group; 65mg/L (range; 10-181) in the once/week group; and 63mg/L (range; 7-183) in the control ($p=0.0011$). **Conclusions:** Since the prevalence of anemia was low, detecting an effect on Hb was not possible. Sprinkles provided 5-days/week improved iron stores over once/week dosing. Safety of a 30mg Fe dose of Sprinkles was demonstrated by the absence of any Fn values outside the normal range. Supported by the HJ Heinz Foundation and CIHR.