A critical rationale for preventing anemia in preschool children, and especially in children under 2 years, is the improvement of short- and long-term cognitive development


Iron and Cognitive Development: What is the Evidence?

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Key insights

The most frequently used iron interventions in clinical and public health practice are oral iron supplements and multiple micronutrient powders. Yet, despite decades of research, there is a lack of conclusive evidence to guide the optimal strategy for addressing iron deficiency in infants and children. The heterogeneous findings from different studies may be due to differences in dosage, duration, and timing of iron treatment, the baseline characteristics of the study population (particularly in terms of anemia and iron status), and compliance with the study interventions.

Current knowledge

The first 1,000 days of a child’s life are of critical importance for the developing brain. During this period, iron deficiency has far-reaching consequences, the most important of which is impaired cognitive development. There is thus a keen interest in enhancing the interventions that can prevent or treat iron deficiency anemia in pregnancy and within the first 2 years of life. However, there is a lack of conclusive data from high-quality randomized trials testing the effects of various iron interventions during pregnancy, infancy, and childhood on cognitive development.

Practical implications

Although there is clear evidence to support the benefits of iron supplementation on cognitive performance in school-aged children who are anemic, the evidence to support universal iron supplementation in children below 2 years of age remains unclear. Trials in preschool children showed mixed results for visual, cognitive, and psychomotor development, with some studies demonstrating small benefits, whereas others demonstrated no differences compared to placebo. To date, clinical evidence does not appear to advocate the benefits of iron supplementation on child cognitive development during pregnancy. Caution should be exercised to avoid exceeding the recommended doses of iron, as some studies have reported adverse effects of high iron fortification.

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