# Iron supplementation can provide cognitive and physical benefits to anemic children

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Giving daily iron supplements to anemic primary-school–aged children can have cognitive and physical benefits, according to a study published in *CMAJ* (*Canadian Medical Association Journal*).

Globally, approximately 25% of school-aged children are anemic, with iron deficiency the cause of about half of all cases. Iron deficiency, which has been associated with impaired cognitive and physical development, is caused by a lack of dietary iron and, in developing countries, by parasites such as hookworm and schistosomiasis. In developed countries, newcomers, native people and some ethnic populations can be anemic. About 3% of primary-school–aged children in Canada are anemic. However, concerns that iron supplementation may have negative health effects limit efforts to address iron deficiencies.

To understand the effects of iron supplementation, Australian researchers conducted an analysis of 32 studies including 7089 children mainly in low- and middle-income countries. Anemic children who received iron supplements had higher cognitive scores than children in the control groups (9 studies with 2355 children). They also showed substantial improvement in IQ scores and other cognitive tests. Children who received iron supplements were also slightly taller for their age and had improved weight-for-age compared with children who did not.

"We found evidence of a benefit of iron supplementation on cognitive performance among primary-school–aged children, including on IQ among children with anemia," writes Dr. Sant-Rayn Pasricha, The Royal

Melbourne Hospital and the Faculty of Medicine, Dentistry and Health Sciences, The University of Melbourne, with coauthors. "Iron may also improve growth. Daily iron supplementation decreased the prevalence of anemia by about 50% and reduced the prevalence of iron deficiency by 79%."

There appeared to be no adverse effects, with no differences in the prevalence of malaria or gastrointestinal issues between the groups that received iron and the control groups. In addition, some studies reported fewer respiratory tract infections.

The study is larger and broader than others, with a comprehensive analysis of benefits and safety of iron supplementation.

"Iron supplementation benefits global cognitive performance … .Routine daily iron supplementation is likely to benefit cognitive performance in primary school children in developing settings where anemia is prevalent and testing hemoglobin before iron supplementation may not be feasible," the authors conclude.

In a related commentary, Dr. Katherine Gray-Donald, McGill University, Montréal, writes that this meta-analysis "is important in that it quantifies the robust effects of iron supplementation on cognitive performance among anemic children who are iron deficient. The next challenge is to determine how to safely, economically and sustainably provide better iron nutrition to children in many poor settings of the world. Clearly anemic children will benefit, but the risks of iron for all remain to be elucidated."

**More information:** Research paper: www.cmaj.ca/lookup/doi/10.1503/cmaj.130628
Commentary: www.cmaj.ca/lookup/doi/10.1503/cmaj.131249

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