

The effect of iodine supplementation on cognitive and motor function in iodine-deficient Albanian schoolchildren: a randomized, controlled, double-blind clinical trial

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Background

Iodine is required for the production of thyroid hormones, which are necessary for normal brain development and cognition. Although several randomized trials examined the effect of iodine supplementation on cognitive performance in schoolchildren, the results were equivocal.

Objective

We aimed to ascertain whether providing iodized oil to iodine-deficient children would affect their cognitive and motor performance.

Design

In a double-blind intervention trial, 10–12-y-old children (n = 310) in primary schools in rural southeastern Albania were randomly assigned to receive 400 mg iodine (as oral iodized oil) or placebo. We measured urinary iodine (UI), thyroid-stimulating hormone (TSH), and total thyroxine (TT4) concentrations and thyroid gland volume (by ultrasound). The children were given a battery of 7 cognitive and motor tests, which included measures of information processing, working memory, visual problem solving, visual search, and fine motor skills. Thyroid ultrasound and biochemical and psychological tests were repeated after 24 wk.

Results

At baseline, the children's median UI concentration was 43 µg/L; 87% were goitrous, and nearly one-third had low concentrations of circulating TT4. Treatment with iodine markedly improved iodine and thyroid status: at 24 wk, median UI in the treated group was 172 µg/L, mean TT4 was ≈40% higher, and the prevalence of hypothyroxinemia was 1%. In the placebo group after the intervention, these variables did not differ significantly from baseline. Compared with placebo, iodine treatment significantly improved performance on 4 of 7 tests: rapid target marking, symbol search, rapid object naming, and Raven's Coloured Progressive Matrices (P < 0.0001).

Conclusion

Information processing, fine motor skills, and visual problem solving are improved by iodine repletion in moderately iodine-deficient schoolchildren.