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The effects of iodine on intelligence in children: a meta-analysis of studies conducted in China.

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Abstract

This study quantifies the effects of iodine on the intellectual development of children using a systematic manual literature search of Chinese publications related to iodine deficiency disorders. The Chinese Medical Reference Database, Medline, and Cochrane library were searched electronically in Chinese and English. Inclusion criteria included: studies conducted in China, comparing children (<16 ys) living in naturally iodine sufficient (IS) with those in severely iodine deficient (ID) areas, or children in ID areas born before and after the introduction of iodine supplementation. Intelligent Quotient (IQ) was measured using Binet or Raven Scales. The iodine sufficient control groups were comparable socially, economically, and educationally with the study groups. Random effects models were used in the meta-analysis. Effect size was the standard deviation IQ point (SIQP), which is equivalent to 15 IQ. Thirty-seven reported studies, total 12,291 children, were analysed. The effect size was an increase of 0.83, 0.82, and 0.32 SIQP respectively, for the children living in IS communities compared with those living in ID areas with no iodine supplementation, with inadequate iodine supplementation, or children who had received iodine during their mothers' pregnancy and after birth. These equal to 12.45, 12.3, 4.8 IQ points. Compared with that of children whose mothers were persistently exposed to ID, the total effect size of the 21 entries was an increase of 0.58 SIQP (8.7 IQ points) in the group receiving iodine supplementation during pregnancy. Furthermore, there was an increase on 1.15 SIQP of Binet or 0.8 SIQP on Raven Scale (17.25 or 12 IQ points) for children born more than 3.5 years after iodine supplementation program was introduced. The level of iodine nutrition plays a crucial role in the intellectual development of children. The intelligence damage of children exposed to severe ID was profound, demonstrated by 12.45 IQ points loss and they recovered 8.7 IQ points with iodine supplementation or IS before and during pregnancy. Iodine supplementation before and during pregnancy to women living in severe ID areas could prevent their children from intelligence deficit. This effect becomes evident in children born 3.5 years after the iodine supplementation program was introduced.



Publication types, MeSH terms, Substance



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