



## Kids' nutritional deficits might affect brain health

It is well-known that an adequate supply of all essential nutrients is required for normal brain development of infants and growing children. A limited supply of key nutrients, starting in pregnancy and up to the adult years, can have a profound negative impact on mental functions.

In some developing countries, a variety of nutrient deficiencies cause brain development problems that have severe lifelong consequences. In countries like the United States, however, these nutrient deficiencies may exist in less extreme and less obvious forms, even in people who appear to be eating well. These marginal deficiencies may affect brain function of infants, children and even adolescents in more subtle ways than those seen in developing countries. Could some of these nutrient inadequacies be contributing to increasingly prevalent conditions like attention deficit hyperactivity disorder and autism?

**Question:** Which brain-critical nutrients are most likely to be deficient in the diets of Americans?

**Answer:** Likely candidates include iron, iodine, choline, vitamins B12 and D, and the long-chain omega-3 fatty acids (EPA and DHA). The type of diet typi-

cally consumed by an individual determines which of these nutrients may be limited.

Iron is the most commonly deficient nutrient in the world, affecting mainly women and children. In the United States, the prevalence of iron deficiency anemia in women of childbearing age is estimated to be between 4 percent and 8 percent. However, the number of women affected by long-term non-anemic iron deficiency is less clear.

A woman's iron needs to increase by 50 percent during pregnancy. If she does not meet her iron needs during pregnancy, her infant will be born with low iron stores. Healthy infants have about four to six months of iron stored in their body at birth. Since breast milk is not a good source of iron, a breastfed infant's iron stores are typically low at 4 to 6 months of age. Since adequate iron is so important for normal brain development, the American Academy of Pediatrics recommends that exclusively breastfed infants be given an iron supplement at 4 months of age until appropriate iron-containing foods are being consumed by the infant. Guidance on the dosage and form of iron supplement should be obtained from a pediatrician.

The role that iron deficiency plays in conditions like ADHD and autism is not entirely clear. However, some researchers report that low iron status is common in children with autism and that improving their iron status with supplements can reduce symptoms. One study found that eight weeks of iron supplementation reduced the restless sleep common in autistic children.

Brain development continues during the teens. A study just published by researchers from UCLA found that low iron status during adolescence had an impact on nerve structure in the brain that was measureable in their early adult years. How this may affect brain function remains to be explored.

The potential damage done by iron deficiency underscores the importance of consuming a diet that meets all nutrient needs. Since the best absorbed form of iron comes from lean red meat, the trend toward consuming less meat puts some women and children at greater risk of deficiency.

Our next article will explore other nutrients known to affect brain development and function.

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