

Research – Vitamins:

One large comprehensive study found that children with autism had lower levels of several vitamins (especially biotin) and some minerals (lithium, calcium, and magnesium) and impairments in sulfation, methylation, glutathione, ATP, and oxidative stress, compared to neurotypical children of the same age. The severity of autism was strongly associated with the level of certain vitamins and minerals.

Adams JB et al., Nutritional and Metabolic Status of Children with Autism vs. Neurotypical Children, and the Association with Autism Severity, Nutr. Metab (Lond) 2011 Jun 8:8(1):34.

<http://www.nutritionandmetabolism.com/content/8/1/34>

One study in China found that most children with autism had inadequate intake of folic acid, vitamin B6, calcium, vitamin A, vitamin C, and zinc, based on estimating dietary intake from diet logs (not as accurate as blood measurements).

Xia W et al., A preliminary study on nutritional status and intake in Chinese children with autism. Eur J Pediatr 2010, 69(10):1201-6.

One study in Romania found normal levels of vitamin B12 and folate in children with autism compared to controls, but low levels of plasma glutathione, consistent with the Adams et al 2011 study. In other words, it seems that children with autism need extra amounts of vitamin B12 and folate to have normal glutathione.

Paşca SP et al., One carbon metabolism disturbances and the C677T MTHFR gene polymorphism in children with autism spectrum disorders. J. Cell. Mol. Med. 2009, 13(10):4229-4238.

One study found that children with autism had high levels of plasma vitamin B6 presupplementation, and this finding was confirmed in a follow-up study (Adams 2006), suggesting a metabolic imbalance in B6. (See section on High-Dose Vitamin B6 for more info.)

Adams JB, Holloway C.J: Pilot study of a moderate dose multivitamin/mineral supplement for children with autistic spectrum disorder. Altern Complement Med. 2004, 10(6):1033-9.

Adams JB, George F, Audhya T: Abnormally high plasma levels of vitamin B6 in children with autism not taking supplements compared to controls not taking supplements. J Altern Complement Med. 2006, 12(1):59-63.

One study of vitamin D status in Egypt found that young children with autism had lower levels of

vitamin D compared to age-matched controls. However, the Adams et al 2011 study did not find any difference between vitamin D levels in children with autism in the US and neurotypical children in the US. Low levels of vitamin D are a concern for the general population, since vitamin D is made by the body only when exposed to direct sunlight, and nowadays people spend more time inside or shielded from the sun.

Meguid NA, Hashish AF, Anwar M, Sidhom G: Reduced serum levels of 25-hydroxy and 1,25-dihydroxy vitamin D in Egyptian children with autism. J Altern Complement Med. 2010, 16(6):641-5.

One study in Slovakia found that children with autism had significantly higher levels of vitamin C and beta-carotene, but normal levels of vitamin A and vitamin E, compared to older teen controls. This is consistent with the Adams et al 2011 study.

Krajkovicova-Kudlackova M et al. Plasma concentration of selected antioxidants in autistic children and adolescents. Bratisl Lek Listy 2009, 110(4): 247-250.

Many studies have demonstrated that children with autism have substantial oxidative stress, suggesting either a low level of key antioxidants or an increased need for them. (See section on oxidative stress.)

Research – Minerals

One large comprehensive study found that children with autism had lower levels of some minerals (lithium, calcium, and magnesium) compared to neurotypical children of the same age. The severity of autism was strongly associated with the level of certain vitamins and minerals.

Adams JB et al., Nutritional and Metabolic Status of Children with Autism vs. Neurotypical Children, and the Association with Autism Severity, Nutr. Metab (Lond) 2011 Jun 8:8(1):34.

Another study also found that young US children with autism (and their mothers) had unusually low levels of lithium compared to neurotypical children and their mothers. Lithium is receiving increasing recognition as possibly being an essential mineral, as low levels are associated with psychiatric and immunological disorders.

Adams JB et al., Biol Tr El Res 2006, 110:193-209.

Two large studies of iron status found that young US and Canadian children with autism had anemia in 8% and 16% of cases, respectively.

Latif A et al., Iron Deficiency in Autism and Asperger Syndrome. Autism 2002, 6:103.

Dosman CF et al., Ferritin as an indicator of suspected iron deficiency in children with autism spectrum disorder: prevalence of low serum ferritin concentration. Dev Med Child Neurol. 2006, 48(12):1008-9.

One small study of minerals in red blood cells found that young Canadian children with autism had lower levels of RBC selenium and RBC molybdenum than neurotypical children of the same age [24], but similar levels of most other minerals.

Jory J and McGinnis W: Red-Cell Trace Minerals in Children with Autism. American Journal of Biochemistry and Biotechnology 2008, 4(2):101-104.

A small study of zinc and copper in plasma found that British children with autism had similar levels to neurotypical children.

Jackson MJ and Gerard PJ: Plasma Zinc, Copper, and Amino Acid Levels in the Blood of Autistic Children. J Autism Childhood Schizophrenia 1978, 8(2):203-208.

In contrast, a study of Turkish children with autism found that they had lower levels of zinc in plasma and RBC compared to neurotypical children.

Yorbik O, Akay C, Sayal A, Cansever A, Sohmen T, Cavdar AO: Zinc Status in Autistic Children J. Trace Elements Experimental Medicine 2004, 17:101-107.