

Essential Fatty Acids: Critical Nutrients in Autistic Spectrum Disorders

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Increasing evidence suggests that essential fatty acids (EFA's), which are critical nutrients for the brain, may be especially important for children suffering from developmental disorders like autism.

Polyunsaturated fatty acids (PUFAs) are needed for healthy brain development and function. They make up 20% of the brain's dry weight and influence the function of powerful neurotransmitters, including such mood-altering chemicals as serotonin.

Abnormalities of fatty acid and membrane phospholipid metabolism may play a part in a wide range of neurodevelopmental and psychiatric disorders. Interestingly, a similar pattern of fatty acid imbalance has been found in other psychiatric disorders that are characterized by major communication dysfunction, including schizophrenia, attention-deficit disorder, and Rett's syndrome.

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The EFA's are omega 3 and omega 6 fatty acids which cannot be synthesized by humans, but instead must be consumed in the diet. The most concentrated sources of omega-3 EFA's are fish and fish oils, flax seed, canola oil, soybean oil, walnuts, and wheat germ. Vegetables, beans, fruits, meat, and poultry contain lesser amounts. Omega 3 fatty acids are much less stable than omega 6 fatty acids and monounsaturated and saturated fatty acids, so foods containing omega 3 fatty acids have a much shorter shelf life. During the last 100 years, commercial food processing (hydrogenation, heat, bleaching, and deodorizing) has led to a major reduction of omega-3 EFA's in processed foods, in an effort to increase shelf life. Also, changes in the diet of farm-raised animals has significantly reduced their intake of essential fatty acids; for example, farm-raised fish have significantly lower levels of omega-3 fatty acids than wild fish, presumably because the farm-raised fish consume less algae (their source of omega-3 fatty acids). Whereas prehistoric humans consumed a ratio of approximately 1:1 of omega 3 to omega 6, it is estimated that the average American today consumes a ratio of approximately 1:15 of omega 3 to omega 6, primarily due to a decrease in omega-3 consumption.

The three major omega 3 fatty acids are alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA). Humans can convert ALA to EPA and DHA, which are the useful forms, provided they have the necessary vitamin/mineral cofactors for the enzymes to function properly. However, recent evidence shows that the capacity to produce EPA and DHA from ALA is limited and unlikely to supply requirements, especially in rapidly growing young children.

EPA and DHA play many roles in the human body. For example, over 20% of the dry weight of the brain is made up of EFA's, primarily DHA and arachidonic acid. Those fatty acids form structural components of cell membranes and are concentrated in neuronal membranous phospholipids, including the myelin sheath. EFA's are also important for the regulation of many biochemical events including neurotransmitter release and uptake, receptor function in the central nervous system, and various enzymatic processes. Omega 6 and Omega 3 fatty acids are also important in the production of prostaglandins – the chemicals that can either promote or reduce inflammation in the body.

Measuring fatty acid levels in the blood cell membranes (plasma phospholipids) in children with autism, one preliminary study found that average, total levels of omega-3 fatty acids in the autistic children were about 20% lower than in mentally retarded children used as controls.¹ Levels of one important fat,

docosahexaenoic acid (DHA), were 23% lower. These deficiencies resulted in a significantly higher ratio of omega-6 to omega-3 fatty acids in the autistic children.

In a study of 53 boys with ADHD compared to 43 boys without ADHD, the boys with ADHD were found to have significantly lower levels of EPA, DHA, total omega-3 EFA's, and arachidonic acid in their RBCs². Another study of children with ADHD also reported reduced plasma concentrations of EPA, DHA, and arachidonic acid. In a study of boys with behavior, learning, and health problems, it was found that boys with lower omega 3 EFA levels had more behavior problems, more temper tantrums, and more sleep problems.⁴ All of those symptoms are commonly observed in autism.

Another study done in the UK showed that over a three month period, school age children who were supplemented with omega-3 and omega-6 fatty acids showed significant improvement in reading, spelling and behavior compared with the placebo group. When the placebo group was switched to active treatment, similar gains were noted effects⁵.

Fish oil may also be useful in reducing the gastrointestinal problems commonly observed in children with autism. The term "autistic enterocolitis" has been given to the condition common in autistic kids whereby mild inflammation occurs throughout the gastrointestinal tract. A one-year, double-blind, placebo-controlled trial of fish oil in people with Crohn's disease found that subjects taking the fish oil had a significantly reduced relapse rate, with no significant adverse effects⁶. Crohn's disease is an inflammatory disease of the lower GI tract with many similarities to the gastrointestinal problems seen in autism.

There are many different types of EFA's on the market. Fish oil contains EPA and DHA. Cod Liver Oil contains similar EFA's as well as providing vitamin A and D. The vitamin A in cod liver oil helps to support proper vision, behavior, awareness and immune system function. Care must be taken when selecting an EFA product as purity is an issue. EFA's should be tested for contaminants such as mercury, lead, cadmium and PCB's. New Beginnings only carries EFA products that meet strict standards of potency and purity.

References:

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