Omega-3 Fatty Acids Supplementation in Children with Autism: A Double-blind Randomized, Placebo-controlled Pilot Study

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FROM ABSTRACT

Background

There is increasing evidence that fatty acid deficiencies or imbalances may contribute to childhood neurodevelopmental disorders.

Methods

We conducted a randomized, double-blind, placebo-controlled 6-week pilot trial investigating the effects of 1.5 g/d of omega-3 fatty acids (.84 g/d eicosapentaenoic acid, .7 g/d docosahexaenoic acid) supplementation in 13 children (aged 5 to 17 years) with autistic disorders accompanied by severe tantrums, aggression, or self-injurious behavior.

The outcome measure was the Aberrant Behavior Checklist (ABC) at 6 weeks.

Results

We observed an advantage of omega-3 fatty acids compared with placebo for hyperactivity and stereotypy, each with a large effect size.

Results indicated a trend toward superiority of omega-3 fatty acids over placebo for hyperactivity.

No clinically relevant adverse effects were elicited in either group.

Conclusions

The results of this study provide preliminary evidence that omega-3 fatty acids may be an effective treatment for children with autism.

THESE AUTHORS ALSO NOTE:

"Autistic spectrum disorders are characterized by a marked impairment in social interaction, delayed language, and restricted patterns of behavior."

"In addition to these core symptoms, autistic children frequently have serious behavioral disturbances, such as self-injurious behavior, aggression, and tantrums."

Treating autism with drugs has had limited success and can have "unacceptable adverse effects."

"The central nervous system is rich in highly unsaturated fatty acids (HUFA), principally docosahexaenoic acid (22:6n-3, DHA) and arachidonic acid (20:4n-6, ARA), which cannot be synthesized by the human body but must be supplied by nutrition."

"Highly unsaturated fatty acids are essential for normal brain development and function."

"Dietary consumption of the long-chain omega-3 fatty acids eicosapentaenoic acid (20:5n-3, EPA) and DHA, commonly found in fish and fish oil, may modify the risk for certain adult neuropsychiatric disorders."

There is "increasing evidence that fatty acid deficiencies or imbalances may contribute to childhood neurodevelopmental disorders, including attention-deficit/hyperactivity disorder, dyslexia, dyspraxia, and autistic spectrum disorders."

"Parents of children with autism who supplemented their children with omega-3 rich fish oils reported improvements in general health, sleeping patterns, cognitive and motor skills, concentration, eye contact, and sociability, as well as reductions in irritability, aggression and hyperactivity." **[Very Important]**

Twenty-two autistic children and adolescents were used in this study, 82% were male, and they had been under active treatment for a mean of 7.4 years.

Symptom assessments were conducted by using the Aberrant Behavior Checklist, which includes irritability, social withdrawal, stereotypy, hyperactivity, and inappropriate speech. Assessments were undertaken at baseline and at 6-week follow-up after the intervention.

The actively treated children took 1540 mg of DHA + EPA per day.

The placebo treated children took the same amount of coconut oil per day.

DISCUSSION

"One to 3 g of EPA or up to 10 g/d of fish oil preparations (containing mixtures of EPA and DHA) have been beneficial in a range of disorders including schizophrenia, depression, bipolar disorder, attention-deficit/hyperactivity disorder, dyslexia, and dyspraxia."

"The present findings suggest that omega-3 fatty acids may also be an effective and well-tolerated treatment, in particular of hyperactive behaviors including disobedience, distractibility, and impulsivity, in children with autism."

Studies have shown that "DHA and total omega-3 levels are significantly reduced in children with autistic disorders."

There are placebo-controlled omega-3 fatty acid supplementation studies that demonstrated beneficial effects on behavior, reading, and spelling in children with developmental-coordination disorder, which also note reduced impulsivity and a 26% reduction in incident reporting in incarcerated young males.

"These studies together with our study are suggestive that omega-3 fatty acids may be effective in treating aggression and impulsivity."

The underlying mechanism of action may be related to modulation of serotonergic and dopaminergic neurotransmission.

"Alternatively, it has been suggested that DHA or the EPA–ARA [arachidonic acid] ratio might control aggression through depressing the noradrenergic system." **[A very important adjunct to chiropractic spinal adjustments, as we have reviewed articles that suggest that chiropractic spinal adjustments also inhibit the noradrenergic system.]**

"There is the potential that highly unsaturated fatty acids may be able to alter the developmental trajectory associated with autistic spectrum disorders, given their importance for normal brain development."

KEY POINTS FROM DAN MURPHY

1) "The central nervous system is rich in highly unsaturated fatty acids, principally docosahexaenoic acid (22:6n-3, DHA) and arachidonic acid (20:4n-6, ARA), which cannot be synthesized by the human body but must be supplied by nutrition."

2) "Highly unsaturated fatty acids are essential for normal brain development and function."

3) There is increasing evidence that fatty acid deficiencies or imbalances contribute to childhood neurodevelopmental disorders.

4) This study provides evidence that omega-3 fatty acids may be an effective treatment for children with autism.

5) An advantage to treating autistic children with omega-3 fatty acids instead of drugs is that omega-3 supplementation is not associated with any clinically relevant side effects, while treating autism with drugs has had limited success and can have "unacceptable adverse effects."

6) "Dietary consumption of the long-chain omega-3 fatty acids eicosapentaenoic acid (20:5n-3, EPA) and DHA, commonly found in fish and fish oil, may modify the risk for certain adult neuropsychiatric disorders."

7) There is "increasing evidence that fatty acid deficiencies or imbalances may contribute to childhood neurodevelopmental disorders, including attention-deficit/hyperactivity disorder, dyslexia, dyspraxia, and autistic spectrum disorders."

8) "Parents of children with autism who supplemented their children with omega-3 rich fish oils reported improvements in general health, sleeping patterns, cognitive and motor skills, concentration, eye contact, and sociability, as well as reductions in irritability, aggression and hyperactivity." **[Very Important]**

9) "One to 3 g of EPA or up to 10 g/d of fish oil preparations (containing mixtures of EPA and DHA) have been beneficial in a range of disorders including schizophrenia, depression, bipolar disorder, attention-deficit/hyperactivity disorder, dyslexia, and dyspraxia."

10) "The present findings suggest that omega-3 fatty acids may also be an effective and well-tolerated treatment, in particular of hyperactive behaviors including disobedience, distractibility, and impulsivity, in children with autism."

11) Studies have shown that "DHA and total omega-3 levels are significantly reduced in children with autistic disorders."

12) There are placebo-controlled omega-3 fatty acid supplementation studies that demonstrated beneficial effects on behavior, reading, and spelling in children with developmental-coordination disorder, which also note reduced impulsivity and a 26% reduction in incident reporting in incarcerated young males.

13) "Omega-3 fatty acids may be effective in treating aggression and impulsivity."

14) The mechanism of omega-3 supplementation benefit may be:

A)) They improve the production and balance of the brain neurotransmitters serotonin and dopamine. **[Recall, drugs like Prozac, Paxil, and Zoloft increase serotonin levels; Drugs like Ritalin increase dopamine levels].**

B)) DHA or the EPA–ARA [arachadonic acid] ratio might control aggression through depressing the noradrenergic system.
[A very important adjunct to chiropractic spinal adjustments, as we have reviewed articles that suggest that chiropractic spinal adjustments also inhibit the noradrenergic system.]

15) "There is the potential that highly unsaturated fatty acids may be able to alter the developmental trajectory associated with autistic spectrum disorders, given their importance for normal brain development."