The Oxford-Durham Study:  
A Randomized, Controlled Trial of Dietary Supplementation With Fatty  
Acids in Children With Developmental Coordination Disorder  

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FROM ABSTRACT:

Background.  
Developmental coordination disorder (DCD) affects 5% of school-aged children.  

In addition to the core deficits in motor function, this condition is associated commonly with difficulties in learning, behavior, and psychosocial adjustment that persist into adulthood.

Mounting evidence suggests that a relative lack of certain polyunsaturated fatty acids may contribute to related neurodevelopmental and psychiatric disorders such as dyslexia and attention-deficit/hyperactivity disorder.

Given the current lack of effective, evidence-based treatment options for DCD, the use of fatty acid supplements merits investigation.

Methods.  
A randomized, controlled trial of dietary supplementation with omega-3 and omega-6 fatty acids, compared with placebo, was conducted with 117 children with DCD (5–12 years of age).

Treatment for 3 months in parallel groups was followed by a 1-way crossover from placebo to active treatment for an additional 3 months.

Results.  
Significant improvements for active treatment versus placebo were found in reading, spelling, and behavior over 3 months of treatment.

Conclusions.  
Fatty acid supplementation may offer a safe efficacious treatment option for educational and behavioral problems among children with DCD.

ABBREVIATIONS:  
ADHD, attention-deficit/hyperactivity disorder;  
DCD, developmental coordination disorder;
THESE AUTHORS ALSO NOTE:

“Omega-3 fatty acids are essential for normal brain development and function and must be provided by the diet. However, their low levels in modern diets in developed countries are a known risk factor for physical disorders such as cardiovascular and inflammatory diseases.”

“Converging evidence indicates that fatty acid deficiencies or imbalances may also contribute to a range of adult psychiatric and neurologic disorders and to several common and overlapping childhood neurodevelopmental disorders, including attention-deficit/hyperactivity disorder (ADHD), dyslexia (specific reading difficulties), dyspraxia (developmental coordination disorder [DCD]), and autistic spectrum disorders.”

DCD affects 5% of children and shows substantial overlap with ADHD, dyslexia, and autistic spectrum disorders.

This study was a randomized, double-blind, placebo-controlled trial.

Active treatment was a food supplement containing omega-3 and omega-6 fatty acids, whereas the placebo was a similar supplement containing olive oil.

A follow-up period at 3 months “is the minimum suitable for this kind of intervention, because of the slow turnover of these fatty acids in neuronal membranes.”

The active treatment was a supplement containing 80% fish oil and 20% evening primrose oil in gelatin capsules. [Evening primrose oil contains the omega-6 gamma linoleic acid].

A daily dose of 6 capsules provided:
558 mg of eicosapentaenoic acid omega-3
174 mg of docosahexaenoic acid omega-3
60 mg of gamma-linoleic acid omega-6 fatty acid
9.6 mg of vitamin E (natural form, alpha-tocopherol)

Placebo treatment consisted of olive oil capsules. [Omega-9]

Before treatment, achievement scores for reading and spelling were 1 year below chronologic age.

With active treatment with oils for 3 months, reading age increased by 9.5 months for active treatment and 3.3 months for placebo, “a highly significant difference.”

The increase in spelling age was 6.6 months for active treatment and 1.2 months for placebo, again, a highly significant difference.
Between 3-6 months, the oil treatment group reading age improved by 13.5 months and their spelling age improved by 6.2 months.

DISCUSSION

The "hypothesis was that treatment for 3 months with a fatty acid supplement would lead to significant improvements over placebo, as assessed with changes in motor skills, reading and spelling ages, and teacher ratings of behavioral and learning difficulties usually associated with ADHD."

Results showed “significant improvements in reading, spelling, and behavior for active treatment versus placebo during 3 months of treatment.”

This study involved 117 children, between 5 and 12 years of age, from mainstream schools, all of whom met DCD criteria but were otherwise normal and not receiving any other treatment for their specific learning difficulties.

“No adverse events were reported, and the high compliance rate also suggests good acceptability of fatty acid supplements.”

“The improvements in literacy skills and behavior found here are consistent with other reports of benefits from fatty acid supplementation among children selected for dyslexia or ADHD.”

Children in the placebo group fell even more behind with spelling during the 0 to 3 month phase. [Important]

“In contrast, children receiving active treatment made 3 times the expected normal gain in reading age and twice the normal gain in spelling age, bringing their average scores toward normative values.” [WOW!] “In the follow-up phase, they continued to make improvements above what would be expected for chronologic age.”

These authors note that this study showed that omega-3 supplementation improved ADHD symptoms better than did Ritalin (from a 2001 meta-analysis study) at 4 weeks, 3 months, and 6 month follow-ups.

These authors suggest that continuing omega-3 supplementation from 3 to 6 months may produce additional benefits in these ADHD children.

“Fatty acid supplements of this type may be a safe, tolerable, effective treatment for improving academic progress and behavior among children with DCD.”

KEY POINTS FROM DAN MURPHY:

1) 5% of school-aged children are afflicted by developmental coordination disorder (DCD).
2) Developmental coordination disorder children have deficits in motor function, difficulties in learning, behavior, and psychosocial adjustment that persist into adulthood.

3) A relative lack of omega-3 fatty acids may contribute to neurodevelopmental and psychiatric disorders such as dyslexia and attention-deficit/hyperactivity disorder.

4) In these children, with omega-3 supplementation, significant improvements were found in reading, spelling, and behavior over 3 months of treatment compared to control groups.

5) Omega-3 fatty acids are essential for normal brain development and function and must be provided by the diet.

6) Low levels of omega-3 fatty acids in modern diets in developed countries are a known risk factor for physical disorders such as cardiovascular and inflammatory diseases.

7) Omega-3 fatty acid deficiencies contribute to adult psychiatric and neurologic disorders and to several common childhood neurodevelopmental disorders, including attention-deficit/hyperactivity disorder (ADHD), dyslexia (specific reading difficulties), dyspraxia (developmental coordination disorder [DCD]), and autistic spectrum disorders.

8) It takes a minimum 3 months of omega-3 fatty acid supplementation to be suitably incorporated into neuronal membranes.

9) The fatty acid formula used in this study is extremely close to that formulated by Nutri-West (800-443-3333) EPA doubling DHA with some GLA and increased vitamin E.

10) Omega-3 fatty acid supplementation not only improves literacy skills and behavior, but also benefits children with dyslexia or ADHD.

11) Children receiving omega-3 fatty acid supplementation made 3 times the expected normal gain in reading age and twice the normal gain in spelling age, bringing their average scores toward normative values.

12) Omega-3 fatty acid supplementation improved ADHD symptoms better than Ritalin.

13) Omega-3 fatty acid supplementation is a safe, tolerable, effective treatment for improving academic progress and behavior among children with DCD.