Nutritional Treatment for Attention Deficit Hyperactivity Disorder

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Attention Deficit Hyperactivity Disorder (ADHD) is the most recent name for a complex neurobiological disorder which can occur in children, adolescents or adults. Symptoms include difficulty with attention, concentration, memory, organization and for some impulsivity, hyperactivity, aggressiveness and relationship problems. A wide range of behaviors and variability of symptoms are hallmarks of ADHD. Learning disabilities, depression, anxiety, oppositional behaviors and other psychiatric or medical disorders may coexist with ADHD.

The National Institute of Health sponsored a Consensus Conference on Attention Deficit Hyperactivity Disorder (ADHD) in November 1998. A panel of experts reviewed professional literature, listened to professional and public presentations, and then prepared a written report. This Consensus Report (available for public viewing at www.consensus.nih.gov) revealed that "...after years of clinical research and experience with ADHD, our knowledge about the cause or causes of ADHD remains speculative. Consequently we have no strategies for the prevention of ADHD." This revelation has profound implications for psychiatry and the treatment of ADHD. If our current knowledge of ADHD is so limited that we are unable to develop strategies for preventing this condition in the future, then current science is missing a critical component in this psychiatric condition. We believe that the missing ingredient is the notion of nutritional biochemistry as it relates to physiologic function, and particularly neurotransmitter function. This article explores a few aspects of this controversial topic.

Over the past ten years, we have treated over 10,000 patients with ADHD. During this time we have shifted our practice from primarily prescribing medications to recommending blood tests and prescribing nutritional supplements. Our goal has always been to try to understand the cause of ADHD. The more children we study, the clearer it becomes that ADHD does not have a single cause. Although genetics place children at risk, it is not the only factor. Clinical research and oversimplified medical theories view ADHD as a single disorder. We believe it is more accurate to view ADHD as a syndrome with multiple environmental, genetic and metabolic causes.

In our clinic, we have found numerous nutritional and metabolic disturbances related to the symptoms of ADHD. Some of these have been shown to contribute to behavioral and attentional problems - others have not. We have found food allergies, heavy metal toxicity, fatty acid imbalances, magnesium deficiencies, iron deficiencies, zinc deficiencies, infections, dehydration, gastrointestinal problems and carbohydrate intolerance. Some children present with only one of these metabolic disturbances while others may have two or three.

Studies done by the American Dietetic Association (1999)2, the US Department of Health and Human Services3, and the National Cancer Institute4, indicate that a large percentage of children in the United States are not obtaining the RDA for nutrients from their food. In 1997, Munoz et. al. studied 3307 children in the U.S. (age 2-19) to determine the number of children meeting national recommendations for food group intake and found that only 1% met all the recommendations5. Furthermore, 64% of children studied failed to meet the minimum RDA requirements for vegetable
of the 36% that actually met these requirements, 1/4 of all the vegetables they consumed were in the form of French fries! This data is startling and it is becoming more and more evident that our children are not receiving the essential vitamins, minerals and phytochemicals required for proper brain functioning.

Nutritional Therapy has emerged as an alternative or complementary therapy in virtually all areas of health care. Medical research has demonstrated that proper nutrition is critical for the prevention of many chronic illnesses seen in this country. Phytochemicals found in specific fruits and vegetables have been found to have dramatic cancer preventing and/or immune strengthening properties. Mental health research has been slow to embrace nutritional therapies. A small number of scientists have begun publishing research supporting the role of nutrition in psychiatric illnesses6-11. A landmark article recently published in the Archives of Psychiatry12 demonstrated that the omega-3 fatty acids from fish oil may be beneficial in improving symptoms in individuals with Bipolar Disorder. This double-blind intervention trial found that depression was significantly reduced in the experimental group.

A recent conference, "ADHD: Causes and Possible Solutions," organized by Georgetown Medical School was held on November 4-7, 1999. This groundbreaking medical conference supported science which encourages the use of nutrition in treating ADHD. Presentations by academic physicians included a diverse range of topics including the effects of low-level exposure to chemicals, food additives, delayed hypersensitivity reactions to foods and the long term affects of consuming junk foods.

A month prior to this monumental event a report released from the Center for Science in the Public Interest acknowledged that food dyes and certain foods can adversely affect children's behavior. The report "Diet, ADHD & Behavior, A quarter-Century Review" sites 17 controlled studies that detail the effects of diet on behavior. Michael F. Jacobson, the executive director of CSPI stated "It's high time that the government - as well as doctors - provided the public with accurate information that might help many children." This report prompted the U.S. Department of Health and Human Services to strongly encourage parents and professionals to modify children's diets before resorting to any other treatment.

One area of nutrition that has received recent attention is essential fatty acid (EFA) deficiency, faulty EFA metabolism and hyperactivity in children13-16. Essential fatty acids are required constituents of every membrane in the body, including neuronal cell membranes. They serve as essential components in the biosynthesis of eicosanoids, chemicals that effect the working of every cell in the body17. Some of the cardinal signs of an EFA deficiency include excessive thirst, hyperallergic responses to common foods, and skin conditions such as eczema, clinical signs that tend to be common in ADHD children18. Symptoms such as thirst, eczema, and allergies are nonspecific symptoms that may have multiple etiologies unrelated to ADHD. However, this correlation led researchers to hypothesize that fatty acid supplementation would positively affect patients with ADHD19-20 and most clinical research reports are confirming their initial hypotheses21-23. Several case studies have shown that a forced EFA deficiency will lead to neurological abnormalities, and that these abnormalities will reverse with EFA supplementation24-25.

In 1995, Stevens et. al. studied 96 subjects to determine whether ADHD children had a significantly different fatty acid profile from children without ADHD26. They found that all 53 of the ADHD children in the experimental group had significantly lower concentrations of key fatty acids in their plasma polar lipids and in RBC total lipids, while 100% of the 43 subjects in the control group had relatively normal EFA profiles. Twenty-one of the subjects with ADHD also presented with classic EFA deficiency symptoms, including excessive thirst, dry skin, frequent urination and dry hair. The researchers also found that only 45% of the ADHD children were breast fed (for a significantly shorter period than control subjects - on average, two months) as compared to 85% of the control subjects. Breast milk contains a significant amount of DHA27, an important component of brain and peripheral neuron structure28. It is found in high
concentrations around nerve synapses and plays a critical role in the developing brain. At least one study has suggested that children who are breast fed are 50% less likely to manifest symptoms of ADHD than are children who are bottle fed. The results of this study are consistent with other studies on EFAs and ADHD.

In addition to EFA deficiencies, numerous studies have indicated specific vitamin and mineral deficiencies in children with ADHD. For example, in 1997 Tadeusz and Starobrat-Hermelin examined 116 children with ADHD and found that 95% of those examined were deficient in magnesium in blood serum and hair. Magnesium has a profound influence in regulating the central and peripheral nervous systems. Chronic magnesium deficiency results in hyperactivity, impaired reaction to external stimuli, irritability, fatigue, difficulty sleeping, and poor mental concentration. Researchers also discovered a positive correlation between zinc deficiency and hyperactivity. Another study found that 486 hyperactive children had significantly reduced serum, hair and urine levels of zinc as compared to 172 age and sex-matched controls.

While researchers assert that children with ADHD may be deficient in fatty acids or specific vitamins and minerals, the therapeutic implications are not as clear. It is often difficult to interpret these research studies and apply the information clinically. It is also difficult to successfully utilize information published by the lay press which is mostly over-interpreted information drawn from these research articles.

The health food industry has grossly distorted the current literature on nutrition and behavior to sell their products. Many companies profit on parents' fears and make preposterous claims based on poor interpretations of scientific studies. Americans love to take vitamins. We are caught up in a multi-billion dollar frenzy trying to find the right vitamin or herb to cure our ills. The lay press is popularizing the concept of fatty acid supplementation for the treatment of ADHD. The answer is not that simple. If ADHD is seen as a syndrome, then not every child will have the same underlying physiology.

In our clinic, we recommend a Red Blood Cell Fatty Acid Analysis to determine individual fatty acid requirements. After analyzing hundreds of fatty acid test on ADHD children, we have found the differences are as striking as the similarities. Health food stores are filled with brochures recommending DHA and Omega-3 fatty acids. Other publications report success treating ADHD with evening primrose oil - an omega-6 fatty acid. Increasing intake of essential fatty acids in one's diet is a simple healthful dietary intervention. Supplementing with large doses of one fatty acid can be potentially dangerous and set up further metabolic imbalances. Don't buy a supplement for your child because the company brochure makes a connection between fatty acids and brain function. Buy a supplement after a fatty acid analysis was completed on your child and showed a deficiency or imbalance.

Modern psychiatry understands ADHD to be inextricably linked with abnormal brain chemistry. No cause has been identified. Conflicting research reports on dietary interventions are based on oversimplified views of ADHD as a single disorder. If ADHD is seen as a syndrome with multiple environmental, genetic and metabolic causes it becomes clear that nutritional recommendations will need to be based on an individual's biochemistry.

We have found individualized nutritional interventions based on clinical history, physical symptoms and laboratory testing can provide relief for many children with ADHD. Laboratory tests are available for mineral deficiencies, heavy metals, food sensitivities, yeast overgrowth, fatty acid deficiencies and many other functional disturbances. How many physicians have looked for elevated copper levels or recommended food allergy testing when evaluating a child for ADHD?

The prevailing treatment approach for ADHD primarily involves pharmacological manipulation of neurotransmitters.
Medications are routinely prescribed for reducing the symptoms of ADHD. For a particular individual, the right choice of medication, at the correct dosage, can be an invaluable asset in a treatment plan. Unfortunately, over zealous psychiatrists and pharmaceutical companies have helped create a culture of "polypharmacy," (a term used to describe the use of multiple medications) to treat ADHD children. Physicians are prescribing medications to wake up, medications for school, medications for homework, and medications to fall asleep. In 1996, researchers analyzed the prescriptions for the Michigan Medicaid system. Physicians prescribed one or more of some 22 different medications to 57% of ADHD children under three. Over 33% of the children received a combination of medications, and there was no consistency in the combinations of drugs prescribed. In fact, the researchers found that there were thirty different combinations of medications prescribed to these young children.

No scientific literature exists to support the use of these medications in the treatment of children less than three years of age. Furthermore, researchers have not shown if these drugs have any long-term side effects, or if they are even helpful. The medical profession has not really questioned the use of unapproved psychotropic medications for small children (under three!). What the medical professional has consistently questioned is the understanding of nutritional biochemistry and food sensitivities in the treatment of ADHD.

Medicine is typically slow and cautious to accept that nutrition may displace current theories about a medical disorder. Should we wait for the scientific community to analyze and agree upon this research before we act to assure that our children are getting the essential nutrients they need for optimal brain function? Research identified a relationship between folic acid deficiencies and birth defects as early as 1965. It was not until 1992 that the United States Public Health Service shared this critical knowledge with the country and recommended that all women of childbearing age, capable of becoming pregnant, consume 400mcg of folic acid per day. It took the scientific community almost 30 years to accept that a nutrient deficiency might cause a gross distortion in human neuronal development and to recommend supplementation. Thousands and thousands of children were born during this time with preventable birth defects. We don’t want nutritional information concerning ADHD to remain buried in medical dogma. The evidence warrants the establishment of a scientific and social effort to educate physicians, parents and caretakers on the value of optimizing brain function with nutrition. For those patients with specific genetic vulnerabilities, the implications are even more profound, as poor nutrition may very well be the environmental link that accelerates a diseased state like ADHD.

Many of our colleagues dismiss the role of nutrition in ADHD, quoting old negative studies on food additives, sugar and megavitamin therapy. Scientific research over the past ten years has clearly demonstrated that nutrition plays a critical role in brain function. Further clinical studies are desperately needed to address the complicated role nutrition plays in this complicated syndrome.

It is best to seek out a skilled professional to assist in untangling the multiple factors that may contribute to ADHD. Without treatment, ADHD can lead to profound distress at school, work or home. Every child and parent suffering with ADHD should be offered the opportunity to understand and treat the underlying reasons for their behavior. Treating the underlying biochemistry addresses the core of the problem. Although the solution is not simple, the science is now available to develop an organized, sensible, biochemical approach to address the metabolic imbalances of ADHD.