**Attention Deficit Disorder**

**Introduction**

Today one out of every five children has a behavior, or learning disorder. It is a devastating problem that can make living a depressing and nightmarish experience for both parents and the child. Schools are spending more on special education, yet test scores and dropout rates are still dismal.

The problem doesn't end as the children grow up. We just rename the problem delinquency and crime. Medication, psychotherapy, special education, more prisons and police might control the situation. However, none of these methods address causes. Let us focus on biochemical causes.

**Causes Of ADHD**

The causes of attention deficit/hyperactivity disorder (ADHD) can be divided into those within a person and those outside. Outside influences include problems in the family and home environment and inappropriate educational environments or methods. Family factors include, divorce, two working parents, exhausted parents, poor parenting, influence of television and the moral climate of the home. The school system may not be appropriate for all children, contributing to the problem.

Influences from within include structural, energetic and biochemical imbalances. This article will focus on what is known about the biochemistry of children with ADHD and how they can be helped through methods that balance body chemistry.

The relationship between behavior and nutrition is not new. Early in the century, a deficiency of B vitamins was found to be associated with mental confusion, fatigue and even psychosis. In 1950, Abram Hoffer, M.D., a Canadian psychiatrist, originated the field of orthomolecular psychiatry. He discovered that some cases of serious mental illness including schizophrenia could be reversed by giving sufficient amounts of niacin and other vitamins. His work is still ignored in conventional psychiatry.

Benjamin Feingold, M.D., a San Francisco allergist, wrote Is Your Child Hyperactive? some twenty years ago. He found that by eliminating sugar, additives and preservatives from hyperactive children's diets, that half the children reverted to normal behavior. He pioneered the idea that children could have an allergic reaction to common food colorings and additives that affect their behavior. These are called central nervous system allergies. They are reactions to a food, chemical, mold or other substance that cause changes in brain chemistry and behavior.

Between 1979 and 1983, the New York City school system removed the sugar, additives and preservatives from its school lunch program. That change alone produced a 15-percentage point increase in performance on standardized tests. The simple dietary change moved the New York City schools from below national average to above national average. This study was well controlled and involved 800,000 children. Other reasons for the outcome were carefully ruled out. (S. Schoenthaler; International Journal of Biosocial Research 8/2:185-195, 1986).

However, the sale of children's cereals laced with sugar and hundreds of questionable food additives continues unabated. Physicians continue to ignore the effects of these non-foods and rarely even question parents about their child's eating habits. While the FDA seeks to protect us from dangerous vitamins, approval is given for soda pop containing ten teaspoons of sugar per can. Soda pop also contains caffeine and phosphoric acid, a chemical which interferes with the absorption of calcium, magnesium and zinc.

The high salt content of many junk foods such as chips and french fries reduce magnesium levels, worsening magnesium deficiency. Magnesium is essential for nervous system and muscle relaxation. White flour and refined sugar products have been stripped of their B-vitamins as well as their trace minerals. Often, these denatured foods are children's dietary staples.

**Toxic Metals**

The effects of toxic metals such as lead on children's behavior have been known for years. In May 1987, The Lancet, a prestigious medical journal, reported that in a study of 800 English school children, the more lead in the children's blood, the slower their learning rate. Researchers also found there was no safe level of lead.

Other toxic metals such as cadmium, copper and mercury are also known to be associated with behavior change, delinquency and criminality. This information is available in toxicology books, but is overlooked for several reasons. Physicians do not regularly assess toxic metals as part of a medical checkup. Psychologists are also not trained in this knowledge, nor in the assessment tools for toxic metal detection.

In a study of naval recruits, those with high cadmium had the most behavior problems. Mercury toxicity produced the mad hatters described in Alice in Wonderland. Yet 100 million silver amalgam fillings are placed annually in the United States. They contain about 50% mercury. Many are placed in children.

A copper imbalance is commonly found in the hair analyses of ADHD children. Copper is often passed through the placenta to the children during gestation. Copper interferes with zinc, affects thyroid activity and enhances the biogenic amines. These are neurotransmitters that stimulate brain activity. Carl Pfeiffer, M.D., Ph.D. and Dr. Paul Eck have documented the effects of excess copper. They include hyperactivity, mood swings, anxiety, panic attacks, depression and anti-social behavior.

Copper stimulates the old brain, or diencephalon. This is sometimes referred to as the animal brain, as compared to the cortex or new brain. The old brain is responsible for our animal responses, while the new brain modifies these responses and is responsible for complex thought and the higher emotions. People with a copper imbalance actually revert back toward primitive animal responses to their environment.

Copper imbalance is very common. The only reason one can imagine copper imbalance is not recognized is that physicians do not look for it, either in the blood or hair where it is easy to detect.

**Mineral and Vitamin Deficiencies**

Mineral nutrition has a great bearing on behavior. In my experience, calcium, magnesium and zinc are deficient in almost all ADHD children. Supplementation of these minerals can change someone from a little monster or animal into a sweet child. I have heard this comment from so many parents that I am no longer surprised. Recently, a mother called to say her daughter had transformed within a month from a nasty, mean 4-year-old into a sweet child. She said it was like getting to know a different child.

Calcium and magnesium help relax muscles and have a calming effect on the nervous system. Magnesium deficiency is associated with belligerence and irritability. Many ADHD children are tired, because they have trouble going to sleep or staying asleep. This only adds to their difficulties. Calcium and magnesium also function as psychological buffer elements. This means they protect a person from the effects of stress. When they are deficient, the child is more reactive and has a harder time being around other children and maintaining a focus of attention.

Zinc functions as a mood stabilizer. Some researchers actually consider it a calming neurotransmitter in its own right. In the absence of adequate zinc, copper and cadmium accumulate in the brain and other organs, with a negative effect upon brain chemistry. Unfortunately, many mothers' diets are low in zinc. In fact, according to Carl Pfeiffer, author of Mental and Elemental Nutrients, the entire American population is borderline zinc deficient.

Other trace elements such as manganese and chromium also play a critical role in behavior because they influence glucose tolerance. This is discussed in more detail in the next section. Vitamins work in conjunction with the minerals. B-complex vitamins are particularly important for the nervous system. However, all are important for proper body functioning.

**Sugar Blues and Behavior**

A number of years ago a man who murdered the mayor of San Francisco was acquitted based on the "Twinkie" defense. He claimed to be hypoglycemic and therefore out of control of his behavior. It is a poor excuse for murder. However, it is true that when blood sugar falls below about 50 or 60 mg, radical behavior change can occur. Many parents have confirmed that their child's behavior deteriorates after even a small amount of sugar. Sugar quickly alters calcium and phosphorus levels. If there is a hypoglycemic tendency, the blood sugar level can drop too low. The brain begins to starve. It is similar to a computer during a power drop, except the brain tries to survive any way it can and may take drastic action.

Robert Atkins, M.D., measures glucose tolerance in most every patient entering his office. He found that 75% had some degree of glucose intolerance. He says that many physicians do not properly perform and interpret the glucose tolerance test. Unless one measures insulin as well as glucose, a false negative test result can occur.

Our research would confirm this. Hair mineral testing often suggests sugar intolerance in many individuals who have had normal glucose tolerance tests. In many cases, a test is not needed. If a person is irritable before meals, has trouble skipping meals, has reactions to sugar, or inordinate sweet cravings, he or she probably has impaired sugar tolerance. It is very common among children.

One need not look far for the causes. High sugar diets overwork the glucose regulating mechanism. Deficiencies in zinc, chromium, manganese and B vitamins further reduce the body's ability to properly utilize glucose. Toxic metals replace the physiological minerals and further disturb body chemistry. The problem can be controlled and corrected by changing the diet. Adding protein and, at times, fat to the diet helps maintain stable blood sugar levels. Mineral imbalances can be corrected with supplements.

Some parents today feed their children sugar-laden foods out of ignorance or laziness. Others, however, think they are doing the right thing by feeding their children natural, unsweetened apple juice and lots of fruit. They feel that natural sugar is better than sucrose or fructose in processed food. The only advantage of the natural food sugars is that they come with some minerals and vitamins. However, the sugar is the same. It will cause problems for any child who is sugar-sensitive.

Parents are often amazed at the improvement in behavior when all sugars are removed from a child's diet. Any sugar upsets blood sugar equilibrium and can enhance yeast growth. Sugar also enters the blood stream very rapidly. This speeds up the metabolic rate, which is already excessive in most children with ADHD.

**Born Sick?**

One measure of a culture is the attention paid to producing healthy children. By this standard, we rate poorly. The connection between healthy parents and healthy offspring is rarely stressed to young people preparing for marriage and parenting. Our infant mortality rate is high. Our birth defect rate has doubled since 1950. We seem much more interested in heroics and glamorous cures than taking simple steps to prevent birth defects and produce healthy children. It is really bizarre.

Weston Price, in Nutrition and Physical Degeneration, describes a Fiji Island society in which when a woman marries, she is immediately fed special foods to have healthy children. A picture shows a woman holding a special kind of crab to feed newly wed women to produce healthy children. This is sensible prenatal care. Tissue mineral analysis research confirms that a common contributor to ADHD and many other childhood problems is that so many children get a poor start in life. Most children today are born toxic and deficient, due to the nutritional imbalances of the parents. Neurotoxicology books confirm that lead, cadmium, copper and other toxic metals pass right through the placenta from mother to child. Children are described as 'sinks' for these metals.

Once again, the solution is not difficult. Prenatal care must begin at marriage, or earlier. The concept of giving a prenatal vitamin when a woman realizes she is pregnant is much too little, much too late. By the time pregnancy is detected, the child has been in development for several weeks. The first 8-12 weeks of pregnancy are called the 'critical period' because the entire body is formed at this time. At least six months is needed to replenish even one mineral. Prenatal vitamins are usually not complete or geared to the individual.

Animal researchers know that the result of poor diets or toxins fed to animals often don't show up immediately. It may take several generations before problems start appearing. The situation in America today is that several generations have lived on junk food and been exposed to many chemicals and low-dose radiation. The effects are showing up in this generation of children.

Until change occurs in our value system and true prenatal care is practiced, there is little hope for giving children a healthy start in life. All the genetics research that makes the nightly news is not going to correct nutritionally induced problems. What the reporters fail to mention is that nutrients activate genes. Nutrients are needed for the expression of our genetic potential. This is why folic acid, for example, will prevent particular birth defects. Without these nutrients, the genetic potential cannot be expressed and the result is a defective child. We are not saying that nutrition will solve everything, but it is a central factor in birth defects and genetic problems that is hardly mentioned.

**Drugging the Children?**

Many children suffer from antibiotic overkill, sometimes beginning the day they are born. Antibiotics are given for ear infections, colds, flu, sore throats, acne and many other conditions. While at times these may be necessary, many times they are not helpful. A study in the Journal of the American Medical Association, 1991; 266(23): 3309-3317 concluded that children treated with Amoxicillin for middle ear infection had 2 to 6 times the recurrence rate of those who did not receive the antibiotic.

Antibiotics damage the normal intestinal flora and weaken the immune system. The effect persists long after the antibiotic is discontinued. A combination of antibiotic usage, a copper imbalance, antibiotic residues in meat and a high-sugar diet form the perfect environment for candida albicans overgrowth. Candida albicans is a normal inhabitant of the human intestine. However, when it overgrows, it produces alcohol and acetaldehyde, both poisons that can severely affect behavior. Candida overgrowth should be suspected in any child who has taken repeated doses of antibiotics. A trial with an anti-candida medication and low sugar diet will often produce dramatic improvement in energy, behavior and other problems within a week or two.

Once again, most physicians and psychologists don't look for chronic candida in children, so they don't find it. However, it is common, especially in those repeatedly treated with antibiotics. One can use vitamins A and C, Limcomin and herbs such as echinacea and golden seal, along with rest and a light diet, to successfully address most ear infections. Always consult someone knowledgeable if you are not sure what to do.

Antibiotic overuse also contributes to resistant bacteria and other chronic infections. The antibiotics kill the germs, but do not enhance the child's immune system. Over time, chronic conditions develop that can affect a child in subtle ways. Chronic infections can contribute to fatigue, irritability and poor concentration. The child may miss too much school, affecting school performance. One of the most common remarks from parents of children who are placed on corrective nutrition programs is that the children rarely get sick any more. When they do, the episode is mild and over quickly.

Vaccinations may also contribute to ADHD and other afflictions. This is a controversial subject. However, there are many recorded cases of adverse reactions to vaccinations. Parents should consider risks as well as the benefits of vaccinations before making up their minds. In our experience, children raised in a healthy manner and treated properly when ill, have a very small risk of complications from childhood diseases.

**Fast Metabolism and ADHD**

Most ADHD children are fast oxidizers. This term means that on a mineral analysis calcium and magnesium levels are low, while sodium and potassium levels are high. This mineral pattern is associated with over activity of the thyroid and adrenal glands. A fast metabolic rate can contribute to a short attention span, excessive irritability and often aggressiveness and belligerence.

Fast oxidizers are also allergy-prone. Low calcium and magnesium enhance cell permeability, which permits foreign proteins to pass into the blood causing allergic reactions. Fast oxidizers are also very prone to hypoglycemia, as they burn their food more rapidly than normal.

These children are made worse by sugar and all sweets, which further speed up their metabolism. This includes fruit and fruit juices. They benefit from more fats and oils, which have a slowing effect on their metabolism. Many parents are afraid to give their children fats for fear of obesity or raising cholesterol. Children need fat, an essential nutrient for the development of their nervous system. Natural peanut butter, avocado, butter, cheese, olive oil, eggs, meats and other fat-containing foods are very beneficial for these children. They do not cause increased cholesterol or obesity provided the child is healthy.

Stress further increases the oxidation rate. Stress can take the form of too much television, too much activity, or even too many children in a classroom. Fast oxidizers easily become wound up and need peace and quiet to function best. Chronic overstimulation in these children leads to its opposite, a burnout condition which is becoming more common in children. Correcting fast oxidation is another key to ADHD that is routinely overlooked, but fairly simple and inexpensive to improve.

**Burnout and ADHD**

Normally, young children are fast oxidizers. However, we now see more children in slow oxidation, or with a four-low-electrolyte pattern. These patterns represent an exhaustion pattern at a young age. These children can also develop ADHD and related disorders because they are exhausted, even if they seem to play and act like they have plenty of energy. The energy can be nervous energy and they are not as healthy as they may appear. Commonly, their mineral tests reveal toxic metals and other imbalances as well. These children's learning ability and a concentration deficit will often improve when their body chemistry is brought into better balance.

**What Can Be Done?**

Prevention must start now. Mothers and potential mothers, begin NOW to eat well, quit smoking and, if you feel the need, have your body chemistry checked. Do this before you become pregnant, because it takes time to bring body chemistry into balance. The father's role in prevention is not as clear although genetic problems are of course passed on from both parents.

If you have a child with a learning, or behavior disorder, simple measures can make a big difference:

* Feed your child a variety of fresh, natural, minimally processed foods. Take the time to prepare and eat regular meals.
* Keep your child away from sugar in all foods - including many breakfast cereals, snack foods, etc. Even unsweetened fruit juices and fruit can cause problems in sensitive children.
* Avoid giving children soda pop and other junk foods, even if they contain no sugar and no caffeine. These foods contain little nutritive value and can contribute to deficiencies. You are not depriving your child. Explain to the child why. Many children will understand that they feel better off the junk food.
* Don't overfeed your children starches. They can worsen blood sugar imbalances in some children. Good quality fats and oils can be very beneficial.
* Some children are sensitive to food additives. Try eliminating additives, preservatives, artificial colors and flavors. You may notice an improvement in behavior.
* Some children have sensitivities to particular foods. A way to detect this is to note in a journal for two weeks what your child eats and his behavior afterwards. Food allergy testing is also available.
* There is often much that can be done to improve behavior and learning problems through an individualized nutrition program.

**Crime And Delinquency**

This article would not be complete without noting the connection between children's behavior problems and those of adolescents. It is no accident that both problems are escalating together. Mineral analysis research on delinquents and adult offenders reveals the same nutritional imbalances as are present in the ADHD and hyperactive children. An excellent book on this subject is Diet, Crime and Delinquency by Alexander Schauss, Parker House Books, 1982.

The book cites many studies showing a clear relationship between nutrient deficiencies, toxic metals, hypoglycemia, food allergies, junk food diets and criminal behavior. As we spend more money for prisons and police, would it not be wise to examine causes, instead of always dealing with effects?

**Conclusion**

In our experience, most children with ADHD have one or more of the following nutritional imbalances: mineral and vitamin deficiencies, toxic metal accumulation, stimulants in the diet, junk food or other improper diet, hidden infections, chronic candida albicans infection, food or environmental allergies, a rapid rate of metabolism and often nutritional imbalances passed on at birth. Some also have structural imbalances correctable through chiropractic or osteopathic methods.

Diagnostic labels and routine medical evaluations are of little help for these children. Ritalin and related drugs control behavior but often do not improve school performance. However, simple changes in the diet and correction of candida, allergies and nutrient imbalances help many of these children to lead normal lives.

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