Your Monthly Update

Dear Colleague

Welcome to the August newsletter from Pure Bio Ltd.

Did you know. . .?

Cotton production accounts for over 30% of the world's use of pesticides, even though it covers less than 10% of the total area of agricultural land.
Supporting organic cotton trade will drastically reduce the use of pesticides worldwide and thus significantly ease environmental contamination.

Our topic for this month is Attention Deficit Hyperactivity Disorder – ADHD.

Attention Deficit Hyperactivity Disorder (ADHD)

Ranking	Nutritional Supplements	Botanical Medicine
Secondary	Essential fatty acids Iodine (to prevent deficiency during pregnancy) Iron (for deficiency only) L-carnitine Magnesium Zinc	
Other	B vitamins Evening primrose oil Vitamin B6	Shelled hemp seed

Primary – Reliable and relatively consistent scientific data showing a substantial health benefit.

Secondary – Contradictory, insufficient, or preliminary studies suggesting a health benefit or minimal health benefit.

Other – An herb is primarily supported by traditional use, or the herb or supplement has little scientific support and/or minimal health benefit.

Dietary Modification

Overview:

There are several theories regarding diet and ADHD. Some of the most prevalent nutritional and metabolic approaches include:

- **Diets low in sugar and refined carbohydrate, high in quality protein**
- **Elimination /reduction of dietary allergens (sensitivities), and food additives**
- **Treatment of nutritional deficiencies and compromised biological function with nutritional supplementation**
- **Detection of heavy metal toxicity and appropriate measures to reduce toxic burden.**
- **Treatment of intestinal dysbiosis, including pathogenic bacteria, candidiasis, and parasites.**

The two most studied dietary approaches to ADHD are the Feingold diet and a hypoallergenic diet

In the 1970s Benjamin Feingold, MD, popularized the concept that ADHD is caused and aggravated by intolerance to food additives and salicylates. The "Feingold hypothesis" made a case for the negative effects of food additives and preservatives, especially the artificial colors so predominant in diets of children with ADHD. Dr. Feingold's experience suggests that up to 50% of hyperactive children are sensitive to these chemicals. His claims were based on over 1,200 cases in which food additives were linked to behaviour and learning disorders. His program also implicated a reaction to salicylates, not only from aspirin, but salicylates naturally occurring in foods as well. He presented his findings to the AMA in 1973.

The Feingold Diet

I. **Avoid all foods that contain artificial colours and flavours.**

II. **Avoid all foods containing natural salicylates:**

Almonds
Currants
Plums
Prunes
Apples (& cider)
Gooseberries
Raspberries
Apricots
Grapes (& raisins)
Strawberries
Blackberries
Mint flavors
All tea
Cherries
Nectarines
Tomatoes
Cloves
Oranges
Oil of Wintergreen
Cucumbers (& pickles)
Peaches
Wine (& wine vinegars)

III. **Miscellaneous items to avoid:**

Aspirin-containing compounds
All medications with artificial colors or flavors
Toothpaste and toothpowders with restricted colour or flavour (subst. salt/soda)
All perfume

The prevalence of food sensitivities in ADHD patients is generally acknowledged, although the clinical significance and management of these often-subtle reactions remains subject to much debate. At issue in the controversy is the interpretation of the terms "allergy" and "sensitivity". The importance of acute food allergies, IgE-mediated, are well known and generally accepted as clinically relevant. However, the identification of sub-acute food reactions, food intolerance and sensitivities, are subject to debate as to their clinical meaning. Such food sensitivities are generally thought to be IgG-mediated reactions, sometimes called delayed hypersensitivies. Again, studies to delineate delayed hypersensitivies to food are often criticized for having methodological flaws.

Several double-blinded dietary trials have been able to demonstrate that food sensitivities may sometimes provoke hyperkinesis and other ADHD behavior changes, and that elimination of the identified foods has caused an improvement in behavior. A hypoallergenic (oligoantigenic) diet has also been shown to prevent bedwetting and migraines in some hyperactive children.

In one study, children diagnosed with ADHD were put on a hypoallergenic diet, and those children who improved (about one-third) were then challenged with food additives. All of them experienced an aggravation of symptoms when given these additives. Other studies have shown that eliminating individual allergenic foods and additives from the diet can help children with attention problems.

Consuming sugar may aggravate ADHD. One study found that avoiding sugar reduced aggressiveness and restlessness in hyperactive children. Girls who restrict sugar have been reported to improve more than boys.

Hyperinsulinism with low blood sugar may be a factor in aggressive and irritable behaviour seen in ADHD patients. Screening for dysinsulinism with a glucose/insulin tolerance test may be indicated. This is especially true in cases where there is a family history of glucose intolerance and/or diabetes, as hyperinsulinemia with or without hypoglycemia may indicate a prediabetic condition.

Although diet changes alone will not be helpful in every case, it is clear that special diets are effective in many children with attention deficit. A good patient history with other indications of allergy will help in the selection of those appropriate for elimination diets. There are several strategies for assessing food sensitivities that have been utilized in complementary medical practices:

- **Serum IgE, IgG testing (ELISA)**
- **Elimination diet and challenge re-introduction of suspected food allergens**
- **Energetic assessments: for example:**
    - **applied kinesiology,**
    - **electrodermal testing (electroacupuncture or EAV)**

Therapies are generally focused on removal of common or identified allergens and food sensitivities from the diet, and substitution with foods of low antigenic potential.

Some common allergenic foods:

- **wheat (or refined flour)**
- **peanuts**
- **milk**
- **cheese**
- **sugar**
- **corn syrup**
- **barley**
- **eggs**

- corn
- rye
- chocolate
- soy
- oats

The selective introduction of special oligoantigenic food supplements (with low allergenic potential), and devised meal plans often help to accomplish this. A rice beverage may substitute for cow milk. Hydrolyzed whey protein, for example, is often tolerated in dairy-allergic patients and may be added to rice beverage for additional protein and immune enhancement. Some wheat-allergic children tolerate other grains such as spelt, millet, and rice. Sensitive children may tolerate sweetening with rice-syrup solids better than sugar or corn syrup. Lab testing, trial elimination diet, or some alternative form of screening for food sensitivities may help make the choice of appropriate foods more feasible and accurate.

Lifestyle Modification

Smoking during pregnancy should be avoided, as it appears to increase the risk of giving birth to a child who develops ADHD.

Heavy metal toxicity has been reported in ADHD. Although heavy-metal exposure is an environmental risk that affects ADHD and others alike, significantly greater retention of aluminum and cadmium in particular have been observed in ADHD over controls. Lead exposure is also associated with hyperactivity.

High cadmium has been detected in some mineral studies of ADHD children. Low hair zinc may be a marker for elevations in cadmium.

Lead exposure is associated with hyperactivity. There is also a relationship between lead exposure and antisocial behaviour. There also appears to be a direct relationship between the levels of lead and the degree of psycho-social and learning impairment in children.

Nutritional Supplement Treatment Options

Magnesium - **Some children with ADHD have lowered levels of magnesium. In a preliminary, controlled trial, children with ADHD and low magnesium status were given 200 mg of magnesium per day for six months. Compared with 25 other magnesium-deficient ADHD children, those given magnesium supplementation had a significant decrease in hyperactive behaviour.**

Zinc - **In a double-blind study, children with ADHD who received 15 mg of zinc per day for six weeks showed significantly greater behavioural improvement, compared with children who received a placebo.**

L-carnitine - **In a double-blind study, supplementation with L-carnitine for eight weeks resulted in clinical improvement in 54% of a group of boys with ADHD, compared with a 13% response rate in the placebo group. The amount of L-carnitine used in this study was 100 mg/kg body weight per day, with a maximum of 4 grams per day. No adverse effects were seen, although one child developed an unpleasant body odour while taking L-carnitine. Researchers have found that this uncommon side effect of L-carnitine can be prevented by supplementing with riboflavin.**

Essential Fatty Acids - **Many ADHD children have a deficiency of essential fatty acids (EFAs) either because they cannot metabolise linoleic acid normally, or because they cannot absorb EFAs normally from the gut, or because their EFA requirements are higher than normal.**

Factors to consider regarding EFAs deficiency:

- **Most of the food constituents which cause trouble in ADHD children are weak inhibitors of the conversion of EFAs to prostaglandins (PGs).**
- **Boys are much more commonly affected than girls and males are known to have much higher requirements for EFAs than females.**
- **A high proportion of ADHD children have abnormal thirst and thirst is one of the cardinal signs of EFA deficiency.**
- **Many of ADHD children have eczema, allergies and asthma which some reports suggest can be alleviated by EFAs.**
- **Many of ADHD children are deficient in zinc which is required for conversion of EFAs to PGs.**
- **Some ADHD children are badly affected by wheat and milk which are known to give rise to exorphins in the gut which can block conversion of EFAs to PGE1.**

A deficiency of several essential fatty acids has been observed in some children with ADHD compared with unaffected children. One study gave children with ADHD evening primrose oil supplements in an attempt to correct the problem. Although a degree of benefit was seen, results were not pronounced. In a 12-week double-blind study, children with ADHD were given either a placebo or a fatty-acid supplement providing daily: 186 mg of eicosapentaenoic acid (EPA), 480 mg of docosahexaenoic acid (DHA), 96 mg of gamma-linolenic acid (GLA), 864 mg of linoleic acid, and 42 mg of arachidonic acid. Compared with the placebo, the fatty-acid supplement produced significant improvements in both cognitive function and behavioural problems. No adverse effects were seen.

Diets high in polyunsaturated oils, trans-fatty acids, hydrogenated oils and other synthetic fats should be restricted. Healthy oils participate in formation of desired forms of prostaglandins that are essential to well-being. Synthetic fats are more likely to have negative metabolic consequences on neuronal membrane function and prostaglandins, as well as brain function.

Iodine - **In a preliminary study of women in Italy, iodine deficiency severe enough to cause hypothyroidism during pregnancy was associated with an increased risk of ADHD in their children.**

Iron - **Iron status, as measured by the serum ferritin concentration, was significantly lower in a group of children with ADHD than in healthy children. Ferritin levels were below normal in 84% of the children with ADHD, compared with 18% of the healthy children. Since iron deficiency can adversely affect mood and cognitive function, iron status should be assessed in children with ADHD, and those who are deficient should receive an iron supplement. The frequent occurrence of 'restless legs syndrome' in children with ADHD may be associated with iron deficiencies. Some studies have shown a relationship between low iron status and the restlessness and disturbed sleep that is seen in individuals with ADHD.**

B vitamins, **particularly *vitamin B6*, have also been used for ADHD. Deficient levels of vitamin B6 have been detected in some ADHD patients. In a study of six children with low blood levels of the neurotransmitter serotonin, vitamin B6 supplementation (15–30 mg/kg body weight per day) was found to be more effective than methylphenidate (Ritalin®). However, lower amounts of vitamin B6 were not beneficial.**

Vitamin B3 - **33 children under the age of 13 with disturbed behavior were placed on nicotinamide (B-3) with doses from 1.5 to 6 gms daily along with 3 gms of ascorbic acid. Only 1 out of 33 failed to respond to the B-3 therapy. All of the responders then relapsed upon substitution with placebo, and then improved again upon restarting the B-3.**

Intestinal Dysbiosis

This is another factor in ADHD. Some of the 'biomarkers' of intestinal flora are known to have neurotoxic effects. Over-growth of pathogenic organisms and imbalanced intestinal ecology are known to produce significant amounts of endotoxins, which can be measured, quantified, and identified as yeast or bacterial in origin. Certain of these compounds have been identified in urine of children with ADD, ADHD, autism, and other psychiatric disorders. A programme of the 3 R's – remove, repair, replenish/reinoculate - as well as immune enhancement, is required to address this aspect of the disorder.

For further information, contact:

Tracy S Gates

Director

PURE BIO LTD.

01403 730342

info@purebio.co.uk