

## Diet Theories Relating to Autism

Several theories propose a link between diet and autism. One theory proposes that autistic behaviour may be due to metabolic dysfunctions, specifically the ability to break down certain phenolic amine compounds. Another suggests that some severe candidiasis yeast infections can result in autistic symptoms and behaviours. A third is the opioid excess theory and its connection with gluten and casein proteins. Other suggested triggers include vaccines as well as antibiotic use, stress, mercury and other environmental toxic substances. These triggers may act on children who may have some genetic predisposition. Only theories relating to diet are discussed here.

### **a) Theory that autistic behaviour may be due to metabolic dysfunctions, specifically the ability to break down certain phenolic amine compounds.**

Phenolic amines are found in many foods that have been reported by parents to aggravate autistic behaviour, including wheat, corn, sugar, chocolate, bananas, apples and dairy products. A study published by the Society of Biological Psychiatry found that autistic children did have a decreased capacity to use certain sulphate compounds resulting in an inability to effectively metabolize certain phenolic amine compounds (Alberti, Pirrone, Elia, Waring and Romano, 1999). The phenolic amine compounds normally serve as neurotransmitters (messengers to the brain). When these compounds are not properly metabolized, it is suggested, catecholamines (other chemicals in the brain) accumulate and lead to neurotoxic (and psychedelic) effects.

Although this study found that autistic subjects had decreased capacity to use certain sulphate compounds, it should be noted that it was the first study of its kind. Its results have not yet been repeated by other researchers. When evaluating the literature, we must remember the many challenges associated with studying dietary influences and autism. One of the key limitations is that it is next to impossible to use a double blind intervention and control group to compare accurately possible results of the diet treatment. It is also challenging to find subject matches with the same intensity of symptoms and behaviours since autism is understood to span a spectrum. The challenges associated with the use of human subjects with limited ability to give informed consent remains an important ethical dilemma.

### **b) Theory that some severe candidiasis yeast infections can result in autistic symptoms and behaviours**

It has been found that certain strains of candida yeast present in most people's GI tract can overpopulate when antibiotics deplete our normal gut flora. It has been reported that a severe *Candida albicans* infection can lead a person to crave foods rich in yeast and carbohydrates, the foods which candida need to thrive. These same foods are reportedly often craved by autistic children. Some previous research has found that severe *Candida albicans* infections have resulted in symptoms resembling autism, including language impairment, social isolation and decreased eye contact (Adams and Conn, 1997). Dr Bernard Rimland, a prominent researcher in autism, is quoted for his views that there is no consensus regarding the relationship between candida infections and autism and that "it is highly probable that a small, but significant proportion of children diagnosed as autistic are in fact victims of a severe yeast infection, and that with treatment of the candida, a few individuals may show dramatic improvement." Prolonged yeast infections may cause damage to the GI tract and may even result in membrane pores leading from the GI tract into the bloodstream. This idea of a leaky gut, whereby foreign particles can enter the blood and travel to the brain may tie in with the next theory.

### **c) Opioid excess theory and its connection with gluten and casein proteins**

The opioid excess theory and the gluten-free casein-free diet provide yet another perspective on the possible link between diet and autism. The theory suggests that peptides derived from gluten and casein, which are normally broken down in the gut and excreted, actually slip through the gut membrane and travel to the nervous system where they interfere with the transmission of nervous signals. The GI membrane in many autistic people has been found to be unusually porous, allowing these peptides entrance into the blood. The gluten proteins found in wheat, oats, barley and rye and the casein proteins found in dairy have opioid activity in the peptide stage when they are not fully broken down. Previous studies have reported some cognitive and behavioural improvements in people with autism after removing gluten and casein from their diet completely. In a study conducted by Whiteley, Rodgers, Savery and Shattock (1999), 22 children with autism and associated spectrum disorders were placed on a gluten-free diet for 5 months and compared with 5 autistic children undergoing a gluten challenge and 6 autistic control subjects. Following three months on the gluten-free diet, improvements were reported in verbal and non-verbal communication, affection seeking, motor skills, awareness of self and environment, attention, calmness, and sleeping patterns. There was less reported aggression. In the gluten challenge group, both parents and teachers agreed that there was a deterioration of verbal and non-verbal communication. Some important limitations of this study include the small sample size, the fairly short duration, and the fact that the diet intervention could not be conducted double blind. However, the results are encouraging and suggest that, if one is able to implement a gluten-free diet, there is a chance of finding some decline in autistic behaviours.

### **Guidance on Testing for Food Intolerances (NON IgE Reactions ONLY)**

Before assuming that someone with Autism is intolerant of gluten and/or casein, s/he should be formally tested. Since intolerances to multiple foods are often associated with autism, a few foods elimination diet may be a helpful way to pinpoint problem areas. A few foods elimination diet requires a very high level of compliance in order to be worthwhile. Typically the patient removes all common potentially allergenic foods and eats only a few simple foods for approximately two weeks. During the two-week period the patient must keep detailed food records and a diary of symptoms. After the two-week period, foods will be added back one at a time as a challenge. This reintroduction of foods can take several weeks. This diet should only be conducted under the direction of a dietitian or physician. A health professional can assist with label reading, provide the list of allowed foods, and help to ensure that a person's nutrient and energy needs are being met. If only one or two foods are questionable, then they can be removed from the diet for two weeks, and then one at a time reintroduced as a challenge on three separate occasions. Food diaries and symptom diaries should be kept, as they are valuable tools for tracking patterns and detecting questionable items.

### **Implementing a Gluten-Free Casein-Free (GFCE) Diet**

The implementation of a gluten-free casein-free (GFCE) diet should be done with the support of a health professionals such as a registered dietitian or a physician. It is essential particularly for growing children on restricted diets to maintain an adequate intake of vitamins and minerals.

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