

# The Brain

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## Adverse reactions to food and the CNS (Central Nervous System)

There is no such thing as “brain allergy” or cerebral allergy. However, as early as 1922, Shannon described “Neuropathic manifestations” in children as a result of anaphylactic reactions to food (1). Rowe in 1950, wrote about “Allergic toxemia” and fatigue, allegedly due to food and inhalant allergy (2). Speer coined the term “tension fatigue syndrome” (3). Crook, in a book written in 1973, re-emphasized the existence of this condition. A number of common complaints related to the central nervous system such as headache, hyperactivity, “mental fuzziness” (and other learning problems), emotional and behavioral problems (of children) and finally, episodes of insomnia/anxiety alternating with periods of listlessness/fatigue were linked to allergy (4). Rapp in recent years has repeatedly claimed that food allergy was responsible for hyperactive behavior in children (5). Although Egger claims to have shown that children’s hyperactivity improved on a special diet, devoid of certain foods and food additives, an immunologic or allergic mechanism to explain why foods were a problem was not identified (6). Despite all these claims, spanning over 70 years, the proponents of a link between symptoms of the central nervous system and food allergy have given no proof of a consistent relationship, using modern techniques including double-blind placebo-controlled food challenge (DBPCFC) (7).

The relationship between allergy and migraine

headaches, two common conditions in the general population, was proposed over 100 years ago (8). Although still debated, there is evidence that dietary factors play some role, probably in a minority of patients, in triggering migraine episodes. Specific chemical mediator release such as histamine and the prostaglandins (PG2a or PGD2) associated with headaches has been found in a few patients who were repeatedly challenged with specific foods, using DBPCFC techniques (9, 10, 11).

### Naturally occurring triggers

Vasoactive amines, naturally in foods such as *histamines* in some cheeses, spinach, eggplant, tomatoes, chicken livers, and wine; *tyramine* in some cheeses, wine, and bakers yeast; *phenylethylamine* in some cheeses and chocolate; and *octopamine*, *phenylephrine*, in citrus fruit, have been reported to exacerbate headaches (12). Although an uncommon side effect, headaches have been reported to occur in a few individuals who ingest aspartane and monosodium glutamate food additives (12).

Probably one of the most widely known theories linking food additive ingestion to behavior or a learning problem in children is the “Feingold hypothesis” first enumerated by Ben Feingold in 1975 (13). According to this theory at least half of the children with attention deficit syndrome with hyperactivity would improve on a diet devoid of colors and preservatives. When this theory was

tested, it was found in some children with this syndrome, colors acted like a drug to affect learning (but not behavior) (14). Review of all the studies evaluating this theory concluded that there are only a small number of patient with the attention deficit syndrome with hyperactivity who would have improved behavior or learning on a Feingold-type of diet (15).

“Sugar allergy” is a misnomer! Allergens contain proteins and not sugar alone.

The hypothesis that excess sugar in the diet can adversely affect behavior is unsubstantiated. Double-blind challenge studies with sucrose or aspartane in normal children have demonstrated no change in behavior (16). The “Sugar task force” of the USA Federal Drug Administration concluded that sugar in the diet did not increase behavior in normal, or hyperactive children nor did it affect children identified as juvenile delinquents (17). Also, it is interesting to note that in some studies, sugar in the diet was noted to have a “calming” effect in some of the children tested.

### **Psychosomatic symptoms**

Pearson has coined a new term “Pseudo food allergy” to describe a group of individuals, usually adults, who believe that a wide variety of somatic complaints, e.g. headache, insomnia, “mental fuzziness” and fatigue as well as generalized aches and pains, are caused by food allergy (18). These individuals may restrict their diet to the point if being nutritionally unsound which can result in disease. As demonstrated in a DBPCFC study in 1983 by Pearson and Rix, many of these patients had no food allergy but definite psychological problems (19). The study showed that patients with this syndrome had few allergic-like symptoms. It also demonstrated that psychological counseling eventually could enable the patient to eat the foods that produced (psychosomatic) symptoms.

### **Chronic fatigue syndrome**

In recent years, a new syndrome called the chronic fatigue syndrome has been observed (20). This is a syndrome, characterized by persistent fatigue, often accompanied by headache, insomnia,

depression, and apathy as well as subjective feeling of fever, chills, lymph node tenderness and sore throat. Persistent Epstein-Barr virus (EBV) immune response has been documented in some of these patients. A possible link between allergy has surfaced, with the finding of 50% of patients in a USA National Institutes of Health study had allergic symptoms and positive allergy skin tests, including some with food allergens. Further studies in a few individuals with the chronic fatigue syndrome and concomitant allergies, has produced evidence suggestive of a faulty B-cell stimulation of the EBV immune response which is somehow linked to excessive IgE response to allergens (21). Further studies are needed to substantiate any connection between allergy and the chronic fatigue syndrome.

### **Food and chemical sensitivity**

Another unconventional theory in medicine which has persisted over the past 40 plus years is *environmental illness*, often referred to as “food and chemical sensitivity” (7). Other names for this syndrome include “environmentally induced disease”, “Ecologic illness”, and the “total allergy syndrome”. In theory, a multitude of foods, food additives, chemicals, bacterial fungal exposure can cause “immune dysfunction” and lead to common somatic complaints such as headache, fatigue, malaise, disorientation, and dizziness, among others. This theory of multiple food (or chemical) sensitivity leading to the above symptoms lacks scientific foundation. The methods used by “clinical ecologists” to diagnose and treat patients allegedly afflicted by this syndrome is not consistent with modern immunologic doctrine. Many of the individuals supposedly afflicted with this condition have been demonstrated to have serious psychological problems (7).

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