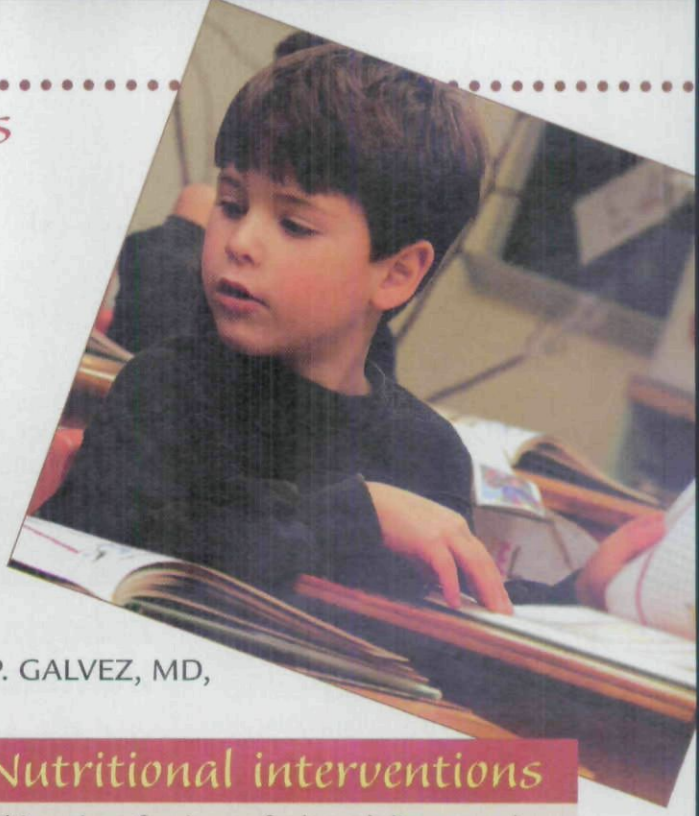

Part two

When parents ask about diet therapy for ADHD

BY SANDRA F. BRAGANZA, MD, MPH, MAIDA P. GALVEZ, MD, AND PHILIP O. OZUAH, MD, PHD

Attention-deficit hyperactivity disorder (ADHD) is characterized by symptoms of inattention, hyperactivity, and impulsivity that impair a child's ability to function.[1,2] Although the treatment mainstays for ADHD in children are stimulant medications and behavior therapy,[3] the medical literature indicates that parents and caregivers of children who have the condition often use dietary interventions in an attempt to manage the child's behavior.[4-6] Despite controversy over the use of nutritional interventions for this disorder, both elimination diets and dietary supplementation are common complementary and alternative medicine treatments for the inattentiveness, hyperactivity, and impulsivity of ADHD.[4-6]

The effect of nutrition on mood and behavior is well known; certain protein-rich foods such as meat, cheese, and eggs contain amino acids that are precursors of neurotransmitters such as serotonin, dopamine, and norepinephrine. These precursors cross the blood-brain barrier and, through complex interactions, are synthesized into neurotransmitters. These neurotransmitters are hypothesized to directly affect behavior and cognition.[2]

Enter the Feingold diet

The late pediatric allergist Benjamin Feingold, MD, was the leading proponent of a nutritional basis for hyperactivity in children.[2] Working with children who exhibited sensitivity to aspirin, foods, and food additives, Feingold described physical reactions and behavioral changes—such as inattention—that he considered to be precursors of hyperactivity and learning disability. Feingold suggested a causal relationship between the

Nutritional interventions

This series of reviews of selected dietary and nutrition interventions for childhood disorders can help you be ready for the parent who is armed with media reports of a nutritional intervention for their child's chronic condition, but who lacks an understanding of its scientific evidence.

In this second of four articles in the Nutritional Intervention series, we discuss whether the Feingold and other diets that eliminate salicylate compounds and food additives can successfully treat attention-deficit hyperactivity disorder (ADHD). In following issues, we will examine vitamin C and megavitamins for asthma, upper respiratory infections, ADHD, and other conditions; and zinc supplementation for diarrhea, colds, and ADHD.

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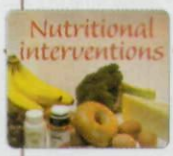


Aspartame is not a salicylate. And it was not in use until 1981 - a year before Feingold's death. HE did not ban it.

MISQUOTING Wender 1986.

Wender really said that only 1% reacted to the challenges ... but diet had to "work" before kids could be challenged ... so diet worked SO WELL that small single challenges did not undo benefit.

increased use of artificial colorings and flavorings in food products and the incidence of hyperactivity and learning disability.[7,8] Based on his observations, Feingold developed a salicylate elimination diet that prohibited not only the salicylate-containing compounds aspirin and aspartame, and foods containing dyes and preservatives, but also apples, berries, grapes, oranges, peaches, plums, cucumbers, and tomatoes. These fruits and vegetables were thought to form chemicals similar to acetylsalicylic acid, which contained a so-called salicylate radical. Dr. Feingold did not, however, specify which of the salicylate chemicals could produce an effect, and at what dosage.[8] Feingold claimed that the schoolwork of an ADHD child who was on this diet would improve, and that hyperactive behaviors would diminish.[7,8]

This info is not known

Key Points

Salicylate elimination treatment for ADHD

- A diet that eliminates salicylate-containing compounds such as aspirin and aspartame and foods that contain dyes and preservatives was introduced and popularized as a treatment for hyperactive children in a 1975 book by Dr. Benjamin Feingold.
- Amid concerns that the Feingold diet was based solely on anecdotal observations, food challenge studies were conducted to assess scientifically the effect of the diet on hyperactivity.
- Double-blind, placebo-controlled trials demonstrated that hyperactivity symptoms improved in only a very small percentage of children studied on the Feingold diet.

Does the diet have an effect?

Despite anecdotal reports and uncontrolled studies conducted in the 1970s that continued to suggest a relationship between elimination diets and behavior, controversy developed within the scientific community over Feingold's claims.[2,8] The most significant concern was a lack of prospective, randomized, controlled trials of the effect of salicylate compounds on behavior: Which, if any, specific chemicals are responsible for the effect, and in what concentrations? A second concern was that parents would alter their child's diet—thereby potentially influencing growth and development—based on anecdotal observations alone. These concerns led to the establishment of the National Advisory Committee on Hyperkinesis and Food Additives, which recommended that the Nutrition Foundation study the effects of the diet with food challenge.[2]

Early food challenge studies demonstrated no change in behavior when a child was on the Feingold diet.[9] A later review of 13 double-blind, placebo-controlled trials in well-defined study population of 240 children demonstrated that only 1% of children exhibited a consistent improvement of symptoms while on the diet.[8] No change in behavior was reported in more than 90% of children challenged with standardized food dyes.[8] These data provided limited support for any beneficial effect of the Feingold diet except in a small percentage of children with a behavior disorder.

Feingold, today

The Feingold Association, on its Web site (www.feingold.org), describes a *program* that eliminates several classes of artificial colors, antioxidants, aspirin-containing products, and other products such as fragrances to determine if certain foods trigger particular symptoms. (The association claims that eliminating other products, such as fragrances, from the child's environment distinguishes its program from the Feingold *diet* alone). The association asserts that in addition to hyperactivity, conditions such as asthma, ear infections, seizures, sleep disorders, stomachaches, and bedwetting can also be mitigated by the program. It further claims that the program can improve a child's rea-

(right - they might get a deficiency of Red 40!!!)

dyes, etc. also eliminated from lotions, soap, toothpaste - not just diet

No study has ever even been done to verify this hypothesis; they just made it up.

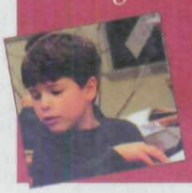
soning and attention span, and curb self-mutilating behavior. There is a lack of sufficient evidence thus far to support these claims. Any improvement that does occur is hypothesized to result from the fact that parents are paying more attention to the child undergoing the program.

What about other dietary interventions for ADHD?

The concept of whether and how diet affects behavior is complex. Researchers continue to investigate the role of diet in learning and in behavior disorders. In addition to food additives, many allergenic foods have been studied for their possible role in inattention, hyperactivity, mood changes, attitude, and sleep.[10,11]

Recent rigorously designed studies have examined different food allergens and multiple forms of other offending agents. Generally in these studies, a child is given a diet that eliminates common food allergens, whether milk, peanuts, soy, wheat, artificial additives, or other foods or agents suspected of causing symptoms in that child. When—if—behavioral symptoms diminish, (usually, the elimination period is maintained for two to four weeks), food items are reintroduced individually for several days. If behavioral symptoms return after the child is given one of those foods or other agents, the child is challenged with that food or agent, but disguised in smell, flavor, and texture to confirm its effect on him (her). More recently, researchers have used double-blind, placebo-controlled studies to determine whether specific agents affect learning and behavior. In a study of the effect, if any, of artificial food color and benzoate preservatives in 3-year-old children in a double-blind crossover study, parents and a tester blinded to the diet observed and recorded the child's behavior.[12] Although parents noted a significant increase in hyperactive behavior when the child was exposed to artificial food color and benzoate preservative, objective testing through clinic assessments found no such difference. This makes it difficult to draw valid conclusions about such dietary changes in pre-school age children, and more studies are needed to further evaluate the role of artificial food color and preservatives in children.

The evidence is insufficient to recommend routine, widespread use of the Feingold diet to treat a child's ADHD symptoms.



Attention to the bottom line

A review of the literature leads us to conclude that scientific evidence is limited to support the use of the Feingold program for treating ADHD symptoms. Although it is possible that a very small group of children who are allergic to salicylate compounds, artificial colorings, or preservatives may show improvement in symptoms on this diet, evidence is insufficient to recommend routine, widespread use of the Feingold diet to treat a child's ADHD symptoms. ■

REFERENCES

1. Schnoll, R, Burshteyn D, Cea-Aravena J: Nutrition in the treatment of attention-deficit hyperactivity disorder: A neglected but important aspect. *Appl Psychophysiol Biofeedback* 2003;28:63
2. Baumgaertel A: Alternative and controversial treatments for attention-deficit/hyperactivity disorder. *Pediatr Clin North Am* 1999;46:977
3. Steer CR: Managing attention deficit/hyperactivity disorder: Unmet needs and future directions. *Arch Dis Child* 2005;90:19
4. Stubberfield TG, Wray JA, Parry TS: Utilization of alternative therapies in attention-deficit hyperactivity disorder. *J Paediatr Child Health* 1999;35:450
5. Bussing R, Zima BT, Gary FA, et al: Use of complementary and alternative medicine for symptoms of attention-deficit hyperactivity disorder. *Psychiatr Services* 2002;53:1096
6. Chan E, Rappaport L, Kemper K: Complementary and alternative therapies in childhood attention and hyperactivity problems. *J Dev Behav Pediatr* 2003;24:4
7. Feingold BF: Why your child is hyperactive. New York, Random House, 1975
8. Wender EH: The food additive-free diet in the treatment of behavior disorders: A review. *J Dev Behav Pediatr* 1986;7:35
9. Weiss B, Weiss B, Williams JH, et al: Behavioral responses to artificial food colors. *Science* 1980;207:1487
10. Boris M, Mandel F: Foods and additives are common causes of the attention deficit hyperactive disorder in children. *Ann Allergy* 1994;72:462
11. Breakey J: The role of diet and behavior in childhood. *J Paediatr Child Health* 1997;33:190
12. Bateman B, Warner JO, Hutchinson E, et al: The effects of a double blind, placebo controlled, artificial food colourings and benzoate preservative challenge on hyperactivity in a general population sample of preschool children. *Arch Dis Child* 2004;89:506-511.

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