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What Common Food Additives Can Cause Acute, Nonallergic Symptoms?

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A 2003 meta-analysis, in which 70 double-blinded studies were pooled, examined the effect of fluoride toothpastes on 42,300 children over a period of 1 to 7 years. Children brushed their teeth with fluoride or placebo toothpaste once or twice daily. The fluoride compounds used were APF, NaF, AmF, SMFP, and SnF2. Concentrations of fluoride varied between 250 and 2,500 ppm. There was a 24% reduction of caries in children brushing with fluoride toothpaste compared with placebo (95% CI, 0.21–0.28; *P*<.0001).[2]

A 2002 Cochrane review, in which 7 studies were pooled for meta-analysis, evaluated the caries-inhibiting effect of fluoride varnish in 2,790 children over a period of 1 to 4.5 years. Of the studies selected, 3 were double-blinded, 5 blinded, and 1 was unclear as to what outcome assessment was used. Dental professionals applied varnish to the teeth with a small brush, probe, or cotton swab 2 to 4 times per year. The fluoride varnishes studied were sodium fluoride–based (Duraphat®, Lawefluor®, and bifluoride 12) or difluorsilane. Concentrations of fluoride varied between 7,000 ppm (difluorsilane) and 56,300 ppm (sodium fluoride–based varnishes) in a volume of 0.5 mL per child for 1 to 4 minutes. The meta-analysis demonstrated a 46% reduction of caries in children who used fluoride varnish treatments compared with placebo or no treatment (95% CI, 0.30–0.63; *P*<.0001).[3]

A 2002 meta-analysis, including 23 studies, examined the caries-inhibiting effect of topically applied fluoride gels in 7,747 children over a period of 1 to 4 years. Of the studies selected, 14 were double-blinded, 6 were blinded, and 5 were unclear as to what outcome assessment was used. The gel was administered either by tray or brush 1 to 140 times per year. The fluorides used were APF, NaF, AmF, and SnF2. Concentrations of fluoride varied between 2,425 ppm (SnF2) and 12,500 ppm (AmF and NaF) in volumes of 1 to 4 mL. Teeth were exposed to the fluoride gels between 2 and 12 minutes. Fluoride gels demonstrated a 28% reduction of caries compared with placebo or no treatment (95% CI, 0.19–0.37; *P*<.0001).[4]

A 2006 Cochrane review of 4 studies investigated whether pit and fissure sealants or fluoride varnishes were superior for preventing dental caries in 317 people over a period of 1 to 9 years. Of the 4 studies, 2 utilized allocation concealment along with randomization. The remaining 2 studies used randomization with an unclear concealment approach. Three of the studies compared fluoride varnishes with pit and fissure sealants directly using either parallel study groups or a split-mouth design. One study compared a combination of fluoride varnish and pit and fissure sealant with fluoride varnish treatment alone. Three different types of sealants were used and applied to both sound and repaired surfaces of teeth. All studies used Duraphat as the fluoride varnish, which was applied twice yearly. Patients using pit and fissure sealants developed fewer caries compared with fluoride varnish after 24 months (risk ratio [RR]=0.75; 95% CI, 0.58–0.95) and 9 years (RR=0.48; 95% CI, 0.29–0.79). Patients using pit and fissure sealant in combination with fluoride varnish developed fewer caries compared with fluoride varnish alone after 24 months (RR=0.36; 95% CI, 0.21–0.61).[5]

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What common food additives can cause acute, nonallergic symptoms?

Evidence-Based Answer

Aspartame may be associated with headaches in susceptible individuals (SOR **B**, based on a small crossover study.) Monosodium glutamate (MSG) is associated with a range of constitutional symptoms; however, with blinding, responses to MSG are rarely consistent. (SOR **B**, based on a randomized controlled trial [RCT].)

A prospective, crossover trial studied 32 patients who reported headaches after ingesting products that contain aspartame. Participants were randomized to

receive aspartame (approximately 30 mg/kg per day) or placebo for 7 days and then were switched to the other ingredient. Only 18 patients completed the full protocol. Patients reported headaches on 33% of the days during aspartame treatment, compared with 24% on placebo treatment (P=.04). Patients who were "very sure" prior to the study that aspartame triggered headaches had a headache 37% of the aspartame days and 18% of the placebo days (P<.001). This study was limited by poor follow-up and small sample size.[1]

In a multicenter, double-blind, placebo-controlled, multiple-challenge evaluation of reported reactions to MSG, researchers recruited participants reporting adverse reactions to an Asian meal that they thought contained MSG. Participants were included only if they reported 2 or more of the following symptoms: general weakness, muscle tightness, muscle twitching, flushing, sweating, burning sensation, headache-migraine, chest pain, palpitations, or numbness-tingling. The study had 4 sequential protocols designed to test for consistency of reaction and the effect of taking MSG with food. A total of 132 participants were initially enrolled.[2]

In the first protocol, participants received 200 mL of a citrus-flavored beverage containing either 0 or 5 g of MSG on day 1 and the alternate beverage on the second day. Eighty-six participants reported 2 or more symptoms when MSG, placebo, or both were ingested. Only 28% (37/132) reacted to MSG and not placebo.[2]

Of the 86 patients with any sort of reaction in the first protocol, 69 participated in the second protocol. They were administered 200 mL of a citrus-flavored beverage that had 0, 1.25, 2.5, or 5 g MSG in a random order. Only 28% (19/69) reacted to 5 mg MSG and not placebo, and 20% (14/69) had the same symptoms on multiple exposures to MSG.[2]

Of these 33, 12 participants were available for the next protocol where, again on alternate days, they received 5-g tablets of MSG or placebo with water. Of these 12 participants, only 2 had symptoms after MSG but not placebo. Neither of these 2 participants had the same symptoms as after MSG ingestion in the first 3 protocols.[2]

In the last protocol, these 2 participants were given a 5-g pill of MSG with food 3 times for breakfast. These 2 participants reported symptoms after only 1 of the 3 MSG challenges administered, and the symptoms were new.[2]

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Are group visits effective for the treatment of obesity?

Evidence-Based Answer

Weight loss therapy consisting of 20 to 30 lifestyle-modification group visits is associated with modest (4–8 kg) weight loss. (SOR **A**, based on homogeneous randomized controlled trials [RCTs].) For patients who participate in group visits, use of sibutramine (15 mg p.o. daily) and compliance with food journaling are both associated with greater weight loss. (SOR **B**, based on an RCT and an outcomes study.)

A 1-year RCT of 224 obese adults (body mass index [BMI] 30–45 kg/m²) compared the effectiveness of group visits for lifestyle modification with pharmacotherapy for obesity treatment.[1] Participants were randomly assigned to receive 1 of 4 treatments: 15 mg sibutramine, sibutramine with brief counseling, lifestyle-modification group visits, or a combination of group visits and sibutramine. The brief counseling consisted of 8 visits of brief lifestyle counseling with prescription renewal. The lifestyle-modification group visits consisted of 30 ninety-minute sessions with 7 to 10 participants led by trained psychologists, using the LEARN (Lifestyle, Exercise, Attitudes, Relationships, and Nutrition) program for weight control for the first 20 sessions. The last 10 sessions used the Weight Maintenance Survival Guide. Combination therapy used the same group visit curriculum as well as 15 mg sibutramine. All participants were prescribed the same diet and exercise regimen.