

**1. *Pediatr Neurol.* 2003 Jan;28(1):9-15.**

**The diet factor in pediatric and adolescent migraine.**

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**Diet can play an important role in the precipitation of headaches in children and adolescents with migraine. The diet factor in pediatric migraine is frequently neglected in favor of preventive drug therapy. The list of foods, beverages, and additives that trigger migraine includes cheese, chocolate, citrus fruits, hot dogs, monosodium glutamate, aspartame, fatty foods, ice cream, caffeine withdrawal, and alcoholic drinks, especially red wine and beer. Underage drinking is a significant potential cause of recurrent headache in today's adolescent patients. Tyramine, phenylethylamine, histamine, nitrites, and sulfites are involved in the mechanism of food intolerance headache. Immunoglobulin E-mediated food allergy is an infrequent cause. Dietary triggers affect phases of the migraine process by influencing release of serotonin and norepinephrine, causing vasoconstriction or vasodilatation, or by direct stimulation of trigeminal ganglia, brainstem, and cortical neuronal pathways. Treatment begins with a headache and diet diary and the selective avoidance of foods presumed to trigger attacks. A universal migraine diet with simultaneous elimination of all potential food triggers is generally not advised in practice. A well-balanced diet is encouraged, with avoidance of fasting or skipped meals. Long-term prophylactic drug therapy is appropriate only after exclusion of headache-precipitating trigger factors, including dietary factors.**

**2. *Pediatr Med Chir.* 1993 Jan-Feb;15(1):57-61.**

**[Migraine and food intolerance: a controlled study in pediatric patients]**

**[Article in Italian]**

**Guariso G, Bertoli S, Cernetti R, Battistella PA, Setari M, Zacchello F.**

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**The possible correlation between migraine and food intolerance has been found to be of great interest in the recent literature. We have studied 43 patients aged from 7 to 18 years suffering from migraine**

without aura according to the classification of International Headache Society (IHS): they had at least 2 attacks monthly and they were pharmacological free of any prophylactic treatment for the latest three months. Each patient was given an allergologic anamnesis. Half of them (group A) were first in oligoantigenic regimen (including 8 simple foods) for 4 weeks. Afterward each patient has been challenged weekly in an open trial, introducing in the diet the different foods and additives previously eliminated; then they have been controlled in a simple double blind study. We have taken skin tests (PRICK method) for the most important allergens (foods and main inhalants), plasma levels of total and specific IgE (PRIST and RAST method), and moreover we have taken histamine plasma levels at the beginning and at the end of the oligoantigenic diet, and during challenge test, only in case of headache attacks. The second half of the patients (group B) were not following any diet nor a pharmacological prophylaxis, but they have been followed up with a clinical diary. Among the patients on oligoantigenic diet 12 only concluded the trial: 6/12 presented a completed remission of headache, 5/12 had a significant improvement of the migrainous pattern, 1/12 patients did not get any improvement after the dietetic treatment. The food recognized responsible of the attacks were: cacao, banana, egg, hazelnuts

3. Lancet. 1983 Oct 15;2(8355):865-9.

**Is migraine food allergy? A double-blind controlled trial of oligoantigenic diet treatment.**

**Egger J, Carter CM, Wilson J, Turner MW, Soothill JF.**

93% of 88 children with severe frequent migraine recovered on oligoantigenic diets; the causative foods were identified by sequential reintroduction, and the role of the foods provoking migraine was established by a double-blind controlled trial in 40 of the children. Most patients responded to several foods. Many foods were involved, suggesting an allergic rather than an idiosyncratic (metabolic) pathogenesis. Associated symptoms which improved in addition to headache included abdominal pain, behaviour disorder, fits, asthma, and eczema. In most of the patients in whom migraine was provoked by non-specific factors, such as blows to the head, exercise, and flashing lights, this provocation no longer occurred while they were on the diet.

4. Ann Allergy. 1985 Aug;55(2):126-9.

**Food allergy and adult migraine: double-blind and mediator**

**confirmation of an allergic etiology.**

**Mansfield LE, Vaughan TR, Waller SF, Haverly RW, Ting S.**

**Foods as a cause for migraine attacks were evaluated in 43 adults with recurrent migraine. Skin testing, elimination diets, double-blind challenges, and measurements of plasma histamine were performed. Thirteen subjects experienced 66% or greater reduction in headache frequency during a diet trial. Six subjects became headache free. Eleven of 16 skin test-positive patients responded to diet manipulation, while only two of 27 skin test-negatives did (P less than .005). Seven subjects agreed to double-blind challenges. In five of seven, at least one food provoked migraine. Placebo challenges did not provoke migraine. In three subjects, plasma histamine rose during migraine provoking challenges. The relationship between food ingestion and migraine is based in part on allergic mechanism. Tests for IgE-specific food allergy appear helpful in selecting patients likely to benefit from diet therapy.**

**5. Recenti Prog Med. 1989 Feb;80(2):53-5.**

**[Migraine and food]**

**[Article in Italian]**

**Pacor ML, Nicolis F, Cortina P, Peroli P, Venturini G, Andri L, Corrocher R, Lunardi C.**

**The frequency of migraine has been studied in adult patients with suspected adverse reaction to foods. Migraine was present in 41 out of 300 patients (13.6%). 38 of these 41 subjects have been treated with elimination diet; 25 (65.7%) obtained a significant improvement of migraine and subsequently, performed challenge test. 24 patients were affected by food intolerance and only one by food allergy. The remaining 13 non-responder subjects suffering from migraine have been subsequently submitted to pharmacological treatment.**

**6. J Pediatr. 1989 Jan;114(1):51-8.**

**Comment in:**

- [J Pediatr. 1990 Sep;117\(3\):509-10.](#)

**Oligoantigenic diet treatment of children with epilepsy and migraine.**

**Egger J, Carter CM, Soothill JF, Wilson J.**

**Department of Neurology, Hospital for Sick Children, London.**

**We studied the role of oligoantigenic diets in 63 children with epilepsy; 45 children had epilepsy with migraine, hyperkinetic behavior, or both, and 18 had epilepsy alone. Of the 45 children who had epilepsy with recurrent headaches, abdominal symptoms, or hyperkinetic behavior, 25 ceased to have seizures and 11 had fewer seizures during diet therapy. Headaches, abdominal pains, and hyperkinetic behavior ceased in all those whose seizures ceased, and in some of those whose seizures did not cease. Foods provoking symptoms were identified by systematic reintroduction of foods, one by one; symptoms recurred with 42 foods, and seizures recurred with 31; most children reacted to several foods. Of 24 children with generalized epilepsy, 18 recovered or improved (including 4 of 7 with myoclonic seizures and all with petit mal), as did 18 of 21 children with partial epilepsy. In double-blind, placebo-controlled provocation studies, symptoms recurred in 15 of 16 children, including seizures in eight; none recurred when placebo was given. Eighteen other children, who had epilepsy alone, were similarly treated with an oligoantigenic diet; none improved.**

**7. Cephalalgia. 1983 Dec;3(4):231-4.**

**Total IgE, specific IgE and prick-tests against foods in common migraine--a prospective study.**

**Pradalier A, Weinman S, Launay JM, Baron JF, Dry J.**

**A prospective study of total IgE, specific IgE against 12 common foods, and prick-tests with 11 common food allergens was performed on 50 consecutive migraine sufferers. Total IgE levels were found above 100 kU/l for seven patients, but five of them were atopic. Prick-tests and RAST were positive for four and six patients (class 1), respectively. Food challenge on these six patients did not cause any migraine attacks. This study thus indicates a very low frequency of allergic dietary migraine to common foods.**

**8. Clin Pediatr (Phila). 1992 May;31(5):302-7.**

**Effect of diet treatment on enuresis in children with migraine or hyperkinetic behavior.**

**Egger J, Carter CH, Soothill JF, Wilson J.**

Hospital for Sick Children, London, England.

Twenty-one children with migraine and/or hyperkinetic behavior disorder which was successfully treated with an oligoantigenic (few-foods) diet also suffered from nocturnal and/or diurnal enuresis. On diet, the enuresis stopped in 12 of these children and improved in an additional four. Identification of provoking foods was by sequential reintroduction of the foods that were avoided on the oligoantigenic diet. In eight of the 12 children who recovered on the oligoantigenic diet and in the four who improved, reintroduction of one or more foods provoked a reproducible relapse of the enuresis. Nine children were subjected to a placebo-controlled, double-blind reintroduction of provoking foods. Six children relapsed during testing with incriminated foods; none reacted to placebo. Enuresis in food-induced migraine and/or behavior disorder seems to respond, in some patients, to avoidance of provoking foods.

9. Clin Exp Rheumatol. 1992 Mar-Apr;10(2):131-5.

Elimination diet in the treatment of selected patients with hypersensitivity vasculitis.

Lunardi C, Bambara LM, Biasi D, Zagni P, Caramaschi P, Pacor ML.

Institute of Clinical Medicine, University of Verona, Italy.

We have evaluated the effects of an elimination diet in 5 patients with hypersensitivity vasculitis and a personal or family history of allergy. The presence of autoimmune disorders, infections and neoplastic diseases was excluded on the basis of physical examination, clinical history and laboratory data. Three patients had elevated serum immune complexes and evidence of complement consumption before the oligoantigenic diet. In one patient food allergy was diagnosed on the basis of a positive and concordant challenge test, skin prick test and RAST. The study consisted of a 3 week elimination diet, followed by open and double blind challenge tests with specific foods and additives. Four patients achieved a complete remission and one patient experienced great improvement on the elimination diet. In three cases the vasculitis relapsed following the introduction of food additives; in one case with the addition of potatoes and green vegetables (i.e., beans and green peas) and in the last case with the addition of eggs to the diet. The offending foods and additives were subsequently eliminated from the usual diet and no relapses were observed in 2 years of follow-up. These results show that in selected patients with a history of allergy,

hypersensitivity vasculitis can be triggered and sustained by food antigens or additives.

10. *Panminerva Med.* 2002 Mar;44(1):27-31.

**Food and headache attacks. A comparison of patients with migraine and tension-type headache.**

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**BACKGROUND:** The role of foods as headache precipitants is still matter of debate. Several studies reported that dietary constituents may precipitate migraine attacks. Some authors reported that also tension type headache attacks may be provoked by foods. The purpose of this study was to evaluate the role of foods as headache triggers in both groups of patients. **METHODS:** We compared the role of foods as headache trigger in patients with migraine and tension type headache. Three hundred and nine patients were involved in the study and divided into six groups: 1) migraine without aura, 2) migraine with aura, 3) episodic tension type headache, 4) chronic tension type headache, 5) migraine without aura associated with episodic tension type headache, 6) migraine without aura associated with chronic tension type headache. **RESULTS:** Approximately one third of the patients reported susceptibility to certain foods. The percentage of food sensitivity was not significantly different between patients with migraine or tension type headache. The foods more commonly reported as headache triggers were alcoholic drinks, chocolate and cheese. No difference in specific food sensitivity between groups was found. The comparison of food-sensitive with food non-sensitive patients showed no significant difference in the clinical features. **CONCLUSIONS:** Our study suggests that foods may trigger not only migraine but also tension type headache attacks.

11. *Lancet.* 1979 May 5;1(8123):966-9.

**Food allergies and migraine.**

Grant EC.

60 migraine patients completed elimination diets after a 5-day period of withdrawal from their normal diet. 52 (87%) of these patients had been using oral contraceptive steroids, tobacco, and/or ergotamine for an average of 3 years, 22 years, and 7.4 years respectively. The

commonest foods causing reactions were wheat (78%), orange (65%), eggs (45%), tea and coffee (40% each), chocolate and milk (37% each), beef (35%), and corn, cane sugar, and yeast (33% each). When an average of ten common foods were avoided there was a dramatic fall in the number of headaches per month, 85% of patients becoming headache-free. The 25% of patients with hypertension became normotensive. Chemicals in the home environment can make this testing difficult for outpatients. Both immunological and non-immunological mechanisms may play a part in the pathogenesis of migraine caused by food intolerance.

12. Rev Neurol. 1996 May;24(129):534-8.

[Diet and migraine]

[Article in Spanish]

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Some foods in our diet can spark off migraine attacks in susceptible individuals. Some foods can bring an attack on through an allergic reaction. A certain number such as citrus fruits, tea, coffee, pork, chocolate, milk, nuts, vegetables and cola drinks have been cited as possible allergens associated with migraine. This mechanism has however been criticized: an improvement in symptoms by eliminating some food(s) from our diet does not necessarily mean an immunologically based allergic reaction. The high IgE incidence rate is not greater in such patients than in the population at large. Other allergic reactions unrelated to diet may also be associated with migraine attacks. On the other hand substances in food may be the cause of modifications in vascular tone and bring migraine on in those so prone. Among such substances are tyramine, phenylalanine, phenolic flavonoids, alcohol, food additives (sodium nitrate, monosodium glutamate, aspartame) and caffeine. Another recognized trigger for migraine is hypoglycemia. Such foods as chocolate, cheese, citrus fruits, bananas, nuts, 'cured' meats, dairy products, cereals, beans, hot dogs, pizza, food additives (sodium nitrate, monosodium glutamate in Chinese restaurant food, aspartame as a sweetener), coffee, tea, cola drinks, alcoholic drinks such as red wine, beer or whisky distilled in copper stills, all may bring on a migraine attack. For every patient we have to assess which foodstuffs are involved in the attack (not necessarily produced

by consuming the product concerned) in order to try to avoid their consumptions as a means of prophylaxis for migraine

13. *Minerva Pediatr.* 1990 Jun;42(6):215-8.

[Hemicrania and food allergy in children]

[Article in Italian]

Lucarelli S, Lendvai D, Frediani T, Finamore G, Grossi R, Barbato M, Zingoni AM, Cardi E.

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Ninety-two children affected by migraine were studied, of which 49 had positive skin tests to one or more foods. Forty of those who tested positive (87%) improved after following an elimination diet for 4-6 weeks and were positive for at least one challenge test for the same types of foods which resulted in positive skin tests. Thirty-one children were cured following the elimination diet and 9 improved. At two years, despite the reintroduction of the suspected food or foods 6 to 12 months after the start of the elimination diet, these results remained unchanged.

14. *Postgrad Med J.* 1980 Sep;56(659):617-21.

The clinical features of migraine as a manifestation of allergic disease.

Wilson CW, Kirker JG, Warnes H, O'Malley M.

Patients with a clinical history of migraine were evaluated psychiatrically, and by electroencephalography. They were challenged with food antigens by skin-prick test, and abdominal symptoms were evaluated following oral ingestion of food allergens. A significant correlation was found between challenge with specific food allergens and the development of migraine headaches, the appearance of abdominal symptoms and the occurrence of positive skin reactions. Psychiatric abnormalities and EEG alterations were associated with the occurrence of headaches and allergic clinical features. It is suggested that the clinical features of migraine can be explained as a result of release of chemical mediators following antigen-antibody reactions in the brain and other tissues where specific antibodies are localized. The continuous ingestion of the responsible food allergens would account for the raised tissue

concentrations of noradrenaline, histamine and other mediators to which the clinical features of migraine are attributed.

15. *J Allergy Clin Immunol.* 1982 Sep;70(3):205-10.

**Double-blind food challenge in the diagnosis of food sensitivity in the adult.**

**Bernstein M, Day JH, Welsh A.**

This study is an attempt to determine the role of double-blind food challenge (DBFC) in suspected food sensitivity in the adult as compared with established tests of food allergy, including the skin test, RAST, and leukocyte histamine release (LHR) to specific food antigens. Twenty-two subjects (ages 18 to 67) with histories of reactions to foods were challenged with freeze-dried food or placebo in opaque dye-free capsules, in increasing doses over a 90 min span to a total of 13 to 15 gm. This was repeated twice at weekly intervals by similar DBFC. DBFC was preceded by skin testing and venapuncture for RAST and LHR studies. Patients were kept under observation for 2 hr, after which each was asked to maintain a detailed diary of related symptoms and food ingested over the following week. Of 46 DBFCs, 13 (21%) were positive. The correlation with positive skin tests and positive DBFC was 4/13 (30%). The correlation with positive LHR and positive DBFC was lower at 2/13 (15%), and 1/13 (7.6%) with RAST. We concluded that DBFC is an effective test of adult food sensitivity compared with tests usually performed and should be used when the diagnosis is in doubt.

16. *Lancet.* 1984 Sep 29;2(8405):719-21.

**Migraine is a food-allergic disease.**

**Monro J, Carini C, Brostoff J.**

Foods which provoked migraine in 9 patients with severe migraine refractory to drug therapy were identified. The patients were then given either sodium cromoglycate or placebo orally in a double-blind manner, with foods previously identified as provocants. Sodium cromoglycate exerted a protective effect, thus confirming that it can prevent a hypersensitivity mechanism as well as the symptoms of migraine. Immune complexes were not produced in those patients who were protected by sodium cromoglycate. These observations confirm that a food-allergic reaction is the cause of migraine in this group of patients.

17. Neurol Neurochir Pol. 1999;33 Suppl 5:55-65.

**[Allergy effect on migraine course in older children and adolescents]**

**[Article in Polish]**

**Wendorff J, Kamer B, Zielinska W, Hofman O.**

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**The interaction between allergy and migraine has been discussed since many years. The aim of the present study was the evaluation of: 1. allergy prevalence in the studied children with migraine, 2. allergy effect on the clinical course of migraine. MATERIAL AND METHOD: The studied group comprised 30 children and adolescents aged 11-17 years with the diagnosis of migraine with or without aura by IHS criteria. In each case the migraine index was determined and symptoms of allergy were sought. Skin prick test and tests for immunoglobulin E in serum were done. The analysis of results showed the presence of allergy in 12 cases (40%), and on this basis two groups were isolated: with and without allergy. The allergic children were given antiallergic treatment for 6 months (pharmacological or diet restriction). RESULTS: In the allergy group the migraine index decreased significantly from 2.45 to 0.33. Headache intensity decreased as well. CONCLUSIONS: 1. In 40% of cases migraine was associated with allergy. 2. Treatment results suggest that allergy and antiallergic treatment may influence the course of migraine attacks.**

