Migraine headaches are a common neurological disorder, and studies show that their prevalence has increased in the last twenty years, especially in children. The cause of the increase in prevalence is not known. The stress of a more hectic and competitive life-style is postulated as a factor, but changes in dietary habits may be equally responsible. Other factors known to precipitate headaches in migraine-susceptible persons (migraineurs) include fatigue, exercise, sleep deprivation, bright lights, head trauma, infection, menstruation, and oral contraceptives. A predisposition to migraine headaches has a neurovascular and neurochemical mechanism, and the disorder is frequently inherited.

Foods and beverages that might trigger an attack of migraine

List of foods, food additives, and beverages that can precipitate headaches in migraine-susceptible persons is long and includes the following:

- Aged or strong cheese
- Cured meats (hot dogs, bacon, ham, and salami)
- Citrus fruits
- Fatty or fried foods
- Chocolate, nuts
- Monosodium glutamate
- Food dyes, additives
- Pickled herring, chicken livers
- Ice cream
- Yogurt, sour cream
- Meat and vegetable extracts
- Pork and seafood
- Canned figs, broad beans, tomatoes
- Caffeine-containing drinks (coffee, tea, all “cola” soft drinks)
- Caffeine withdrawal
- Alcoholic drinks (red wine, beer)
- Aspartame, nitrites, sulfites.

Patients with migraine may be abnormally sensitive to one or more of these dietary items, a disorder sometimes described as a chemical idiosyncrasy or food intolerance. A true food allergy with positive skin testing is uncommon. The chemicals contained in foods that are responsible for the headache triggering effect are chiefly tyramine and other amines, including phenylethylamine and histamine. Tyramine is found in cheese, especially aged, strong and cheddar varieties, phenylethylamine in chocolate, octopamine in citrus fruits, and histamine in red wine and beers. Caffeine addiction and withdrawal, common among consumers of excess coffee, can be associated with severe throbbing headache and migraine exacerbation. Fasting or skipping meals is also a common reason for headache recurrence in migraine sufferers.

Tyramine-triggered Migraine

One of the first reports of the relation of tyramine to the migraine attack was that of Dr Edda Hanington, who observed a headache reaction to cheese eaten by patients treated for depression with certain drugs. The drugs, monoamine oxidase (MAO) inhibitors, inhibit an enzyme that normally metabolizes tyramine, the migraine provoking chemical found in cheese and other foods. MAO inhibitors taken in chance combination with foods rich in tyramine can lead to a hypertensive crisis by releasing the neurotransmitter norepinephrine, another reason for headache symptoms. It is postulated that patients with dietary migraine are sensitive to tyramine-containing foods because of an inherent deficiency of MAO in their liver and blood, and an inability to metabolize tyramine. The elimination of the offending food and chemical from the diet should prevent or lessen the number and severity of migraine attacks.

Other foods known to be associated with tyramine and migraine include beer, wine, pickled herring, chicken liver, yeast, coffee, broad bean
pods, citrus, and canned figs. Patients with depression treated with MAO inhibitors should be given a list of foods to be avoided, especially if they also have a predisposition to migraine.

Chocolate-induced Migraine

Phenylethylamine, theobromine, and caffeine, the chemical triggers in chocolate, may cause a headache by altering the cerebral blood flow and releasing norepinephrine. When adult migraineurs who complained that chocolate provoked their headaches were challenged with either a chocolate bar or a closely matched placebo, 5 of 12 had a typical migraine headache after eating chocolate while none of 8 receiving the placebo suffered a headache.

Caffeine-withdrawal headaches

Caffeine concentrations contained in commonly consumed stimulant drinks vary from a high of 150 mg in a 5 oz cup of coffee to 35 mg in a 12 oz can of cola. Pain relievers taken for headache also contain caffeine. Caffeine causes constriction of cerebral blood vessels. When caffeine intake is interrupted, the blood vessels dilate, and the increase in cerebral blood flow results in headache. Patients sometimes need to be hospitalized to manage a serious addiction and dependency resulting from chronic caffeine overuse.

Alcoholic beverages and Migraine

Any patients with migraine cannot tolerate alcoholic beverages even in small amounts. Alcohol has a vasodilator effect on cranial blood vessels. However, the alcohol per se is probably not the migraine-provoking chemical, but rather, the tyramine and histamine contained in many red wines and beers.

Only a particular variety of grape is responsible in some patients, and young and cheaper varieties are often less well tolerated than aged and more expensive vintages. In some countries, the problem of wine-induced headache has been so widespread at times that vintners have been forced to curtail the production of red wine in favor of white, which is better tolerated by some consumers. Grapes organically grown and wines free of sulfites are thought by some to be less likely to trigger headaches.

A chemical effect on cranial blood vessels by some ingredient in certain alcoholic beverages is the most plausible explanation for the migraine response. Stress may act as a secondary trigger mechanism in some situations. A migraineur exposed to a stressful and tiring work environment may complain of an inability to tolerate wine, whereas the same person on a relaxing vacation may drink and enjoy the same wine without suffering headaches.

Aspartame-triggered Migraine

The FDA and CDC cleared aspartame for general consumption, excepting for children with phenylketonuria (an inborn error of metabolism). Despite this clearance, many scientists expressed caution concerning its use by patients with migraine, epilepsy, and neuropsychiatric problems. In recent years, several studies have demonstrated that headaches may be exacerbated in patients suffering from migraine. The number and scientific standard of these studies reported in the medical literature confirm the role of aspartame as a significant trigger of headaches in migraineurs, and emphasize the need to caution patients regarding the potential adverse effect of this ubiquitous sugar substitute.

Fatty foods and Migraine

Fatty acids, primarily linoleic and oleic acids, may be involved in the mechanism of migraine.

Table I

<table>
<thead>
<tr>
<th>Allergenic or Chemical Triggers</th>
<th>Non-Allergenic Foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy: aged or processed cheese</td>
<td>American or cottage cheese</td>
</tr>
<tr>
<td>Cereals: wheat</td>
<td>Rice, potato</td>
</tr>
<tr>
<td>Meats: hot dogs, salami, fried foods</td>
<td>Lamb, chicken</td>
</tr>
<tr>
<td>Vegetables: broad beans, limas</td>
<td>Broccoli, cauliflower</td>
</tr>
<tr>
<td>Beverages: red wine, beer, sulfites, diet soda, coffee excess</td>
<td>Decaf coffee &amp; cola, some juices</td>
</tr>
</tbody>
</table>
vascular headaches. During a migraine attack, researchers have measured a significant rise in the blood levels of free fatty acids, which occurs simultaneously with the release of serotonin from blood platelets, and an abnormal distension of cranial arteries. The initial aura of a migraine attack, characterized by visual scotomata (blind spots), is associated with cranial artery constriction. This is followed by vasodilatation (distention of blood vessels) as the immediate precursor of a migraine headache. Serotonin has variable effects on cerebral blood vessels, but especially vasodilation. It is speculated that free fatty acids are serotonin releasing factors in the blood.

Paradoxically, certain fish oils containing high quantities of omega-3 fatty acids, as in cod and salmon, have been found to prevent migraine attacks in certain patients. These fatty acids are thought to have a stabilizing effect on nerve cell membranes, making them more resistant to the migraine mechanism.

**Food Allergy and Migraine**

Various foods, including cow’s milk, egg, and wheat cereal, in addition to amine rich chocolate, orange, and cheese, may provoke headache in migraine-susceptible patients, especially children. 6,7 The elimination diet consists of one meat (lamb or chicken), one carbohydrate (rice or potato), one fruit (banana or apple), one vegetable (brassica), water, and vitamin supplements. Of the 82 patients who improved on the diet, all but eight relapsed on reintroduction of one or more foods, including chocolate. Fifty-five different foods provoked symptoms on reintroduction. A remarkable fondness for migraine-provoking foods was a common finding, some patients craving them and eating them in large amounts. Cow’s milk and cheese caused headaches in most of the patients in the study, but none complained of headaches after substituting goat’s-milk cheese.

Unfortunately, the susceptibility to diet-triggered headaches is not consistently confirmed by reactivity to the food, skin-prick tests, and immune globulin antibody titers, and diagnosis by the elimination diet is quite demanding. The reported relationship between food allergy and migraine is difficult to prove, and the concept remains controversial. Many neurologists and allergists are skeptical of the use of restrictive diets in treatment, and a universal migraine-food elimination diet is discouraged in practice. Specific headache triggers should be identified by carefully completed headache calendars.

**Monosodium Glutamate**

The Chinese Restaurant Syndrome, now named “MSG symptom complex,” has been linked to the frequent use of monosodium glutamate (MSG) in some Asian food. Consumers, about 1 in 50 of diners in Asian restaurants, report flushing, tingling, dizziness, and headache. 6,7 Symptoms usually appear within 15-60 minutes after ingesting relatively large amounts of MSG on an empty stomach.

MSG is a flavor enhancer. It is found in frozen foods, canned soups, salad dressings, processed meats, sauces and snack foods. Patients with migraine may have an exacerbation of headaches after ingesting MSG, because of its effects on cranial blood vessels.

**Hunger and Hypoglycemic Headaches**

Fasting and consequent low blood sugar (hypoglycemia) may trigger headaches in patients with migraine. Studies have shown that 50 percent of migraineurs have headaches after 16 hours without food. 9,10

Altered levels of serotonin and norepinephrine and dilation of blood vessels around the brain and scalp are the probable mechanisms of hunger-triggered headaches. Following the ingestion of an excessive carbohydrate load, a vascular headache may also occur in response to a rapid insulin secretion and reactive lowering of blood sugar. The aura of migraine often arises in the visual cortex of the occipital lobe. 11 Visual hallucinations or scotomas form part of aura in one third of patients. 25% of patients complain of unformed flashes of light. Unilateral paraesthesiae associated with hemiparesis or dysphasia is seen in 4% of patients. Olfactory hallucinations 12 of burning, cooking, unpleasant smell may also occur in aura.

To avoid these sugar intolerance, hypoglycemic triggers, migraine sufferers should eat three well balanced meals a day and avoid an overabundance of carbohydrate foods at any single meal. Breakfast
should not be neglected, especially in children.

Nonmedication Therapeutic Techniques in Management of Migraine

Although pain relieving and anti-inflammatory drugs (e.g. acetaminophen, ibuprofen, Naproxen, or triptans) are usually required in the treatment of an acute migraine attack, and some medications (e.g. amitriptyline, propranolol, and anticonvulsants) are effective in prevention of headaches, other nonmedication therapies can prove valuable adjuncts in the management of a migraine patient.13

In addition to diet, alternatives or complements to drug treatments include biofeedback, visualization/imagery and hypnotherapy, muscle relaxation, stretching exercises, aerobic activities, trigger point compression, cold packs or a heating pad, electrical stimulation, massage, acupuncture, manipulation, and psychotherapy. Magnesium and riboflavin vitamin supplements can be beneficial, and feverfew is one of the herbal remedies that is sometimes recommended by practitioners of alternative medicine.

The therapy of migraine is multifaceted and involves treatment of the individual as a whole (physical, nutritional, emotional, and spiritual, or “holistic” therapy) as well as the counseling of family members. Prevention of headaches by careful attention to known migraine triggers is preferable to frequent administration of pain-relieving drugs.

References