peptic ulcer disease, may be more prevalent in headache patients; other medical illnesses prevalent in the general population, such as coronary artery disease, also affect the headache population.

In managing headache patients, the physician should be aware of medications that may exacerbate either headache or a concurrent medical condition, and of alternative therapies for both conditions.

HYPERTENSION

Although headache is not considered a symptom of hypertension, the two disorders commonly occur together. Vasodilators such as hydralazine, minoxidil, prazosin, and nifedipine can exacerbate migraine as well as cluster headaches. Paradoxically, if the patient can be convinced to continue nifedipine therapy, migraine frequency may be reduced. Beta blockers such as nadolol and calcium channel blockers such as verapamil provide good antihypertensive therapy as well as headache prophylaxis. Beta blockers with partial agonist or intrinsic sympathomimetic activity, such as pindolol and acebutolol, may exacerbate migraine. Captopril is effective for migraine prophylaxis and as an adjunct to antidepressant therapy used for muscle contraction headache.

CORONARY ARTERY DISEASE

Ergotamine and methysergide, commonly used in the treatment of headache, should be avoided in the patient with coronary artery disease. Ergotamine can cause coronary vasospasm and methysergide can cause pericardial, cardiac, and pulmonary fibrosis. When a patient has chest pain and concurrent headache, it is important to define the disease before selecting drug therapy. Nitrates may be appropriate if the patient does indeed have coronary artery disease, but they will worsen headaches. Calcium channel blockers and beta blockers, the two drug classes used most widely for angina, also are effective for migraine prophylaxis. Nonsteroidal anti-inflammatory agents, which have no cardiac effects, are good choices for treatment of headache in these patients.

MITRAL VALVE PROLAPSE

Among patients with mitral valve prolapse, 58% of females and 31% of males have migraine, a prevalence that is two to three times higher than in the general population. Beta blocker therapy will control both the symptoms of mitral valve prolapse—chest pain, palpitations, and anxiety—and migraine.

ASTHMA

Almost 50% of patients with aspirin-sensitive asthma have migraine, compared to 13% among patients with non-aspirin sensitive asthma. This subgroup accounts for 4% to 20% of all asthma patients. Aspirin, or an aspirin-containing product with butalbital, will cause anaphylaxis in these patients, and beta blockers will exacerbate the asthma. Treatment options are limited to calcium channel blockers or angiotensin-converting enzyme inhibitors.

PEPTIC ULCER

Among those with cluster headache, the incidence of peptic ulcer may be three times higher than in the general population. The treatment of choice is cimetidine, sucralfate, or an antacid. The other two H_2 antagonists, ranitidine and famotidine, can trigger headaches, even among patients who have not had them previously.

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LYME DISEASE: DIAGNOSIS BY OBSERVATION

The incidence of Lyme disease is increasing nationally as well as in areas of low prevalence, such as Ohio. In 1987, 16 cases occurred in Ohio, of which two were acquired in the state. In 1988, the incidence in Ohio went up to 39 cases, with eight acquired in the state. Between 1984 and 1986, 1,500 cases were reported annually to the CDC. *Ixodes dammini* and *Ixodes pacificus* are the principal vectors of the disease in areas where the disease has been reported most: the northeastern and central United States, and the far West, respectively. However, more widespread distribution may occur in the future. The Lone Star tick, *Ambylomma americanum*, is ubiqitous in this country and has been demonstrated to harbor the spirochete that causes the disease, although it has rarely been directly incriminated

in transmission.

The clinical manifestations of Lyme disease occur in three different stages. The hallmark of Stage I is erythema chronicum migrans (ECM), which presents in 80% of patients 4 to 32 days after the tick bite (only one-third of patients with ECM will remember a tick bite). ECM begins as papular lesion at the site of the tick bite. The lesion may enlarge to as much as 68 cm in diameter, with central clearing and a rim of erythema. Multiple satellite lesions occur in about half of patients; these lesions are usually smaller, without central clearing.

Treatment with tetracycline, 250 mg qid for 10 days, will usually prevent progression to Stages II and III disease. Children and pregnant women are treated with penicillin or, in the case of penicillin allergy, erythromycin.

Constitutional symptoms may be the only manifestations of the disease in 20% of patients. Diagnosis is difficult because the symptoms mimic those of a a variety of infectious and noninfectious diseases. The patient who seeks medical attention may complain of malaise, fatigue, lethargy, headache, fever, and chills. Myalgias, backache, sore throat, and diarrhea also may occur.

Stage II disease consists of cardiac or neurologic involvement, and develops in 8 to 15% of patients who are untreated in Stage I. Cardiac involvement, including fluctuating degrees of atrioventricular block and myocarditis with left ventricular dysfunction, is usually brief, self-limited, and treated symptomatically. Pacing may be required if complete heart block develops, but cardiac symptoms usually resolve within a few days to six weeks.

Neurologic manifestations develop in 10 to 15% of patients who are not treated during Stage I. The classic clinical presentation is a triad of aseptic meningitis, cranial nerve palsies, and peripheral radiculoneuropathy, although these may occur separately. Waxing and waning cranial neuropathies are an important clinical clue to the diagnosis. Neurologic manifestations are treated with high-dose parenteral penicillin; data are inadequate to assess the efficacy of oral penicillin.

Relapsing or remitting chronic arthritis, most commonly involving the knee, is the major manifestation of Stage III Lyme disease. Chronic Lyme arthritis is treated with high-dose parenteral penicillin. Ceftriaxone, 2 or 4 g/d, may become the agent of choice for arthritis patients whose disease is unresponsive to penicillin (There are no data on the use of ceftriaxone for Stage I disease, although it is being evaluated in an ongoing study.)

Diagnosis of Lyme disease at all three stages depends heavily on clinical observation. Biopsy is generally insensitive and culture is cumbersome and usually not commercially available. Serologic diagnosis is notoriously unreliable for diagnosis during Stage I disease; serologic studies are positive in only 10% of patients who present with ECM. Although enzyme-linked immunosorbent assay and indirect fluorescence assay have been touted for their sensitivity in Stages II and III disease, recent data suggest problems with specificity, particularly in the setting of lupus erythematosus, rheumatoid arthritis, and other spirochetal diseases.

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CLUES TO DIAGNOSIS OF A LIFE-THREATENING THROMBOTIC SYNDROME

Early diagnosis and aggressive management of Trousseau's syndrome is essential for patient survival. The syndrome is characterized by venous or arterial thrombotic events associated with occult, often metastatic tumors; the neoplasms commonly involve the lung, pancreas, stomach, colon, or prostate. The thrombotic event can precede diagnosis of the malignancy by as much as one year.

Diagnosis requires a high index of suspicion. Thrombotic events that suggest underlying malignancy include migratory superficial thrombophlebitis, upper extremity thrombosis, multiple-site involvement, and highly inflammatory phlebitis. Thrombosis resistant to anticoagulant therapy also is suggestive.

Trousseau's syndrome should be considered when thrombotic events or pulmonary embolism occur in the absence of predisposing factors such as immobilization, pregnancy, or recent orthopedic or other surgery.

CAREFUL WORKUP

With a suspicious presentation, the recommendation is to complete a careful history and physical examina-