

Headache Assessment and Management

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THE LIFETIME PREVALENCE OF headache is more than 90%.¹ In recent population-based surveys of US adults, nearly 25% annually report recurrent episodes of severe headache and 4% daily or near-daily headache.²⁻⁴ Prescription or non-prescription products are used by 9% of US adults each week to treat headache, matching hypertension as the primary reason for medication use.⁵ The majority of patients presenting to physicians will have primary headache syndromes such as tension-type, cluster, and migraine. Less than 2% of patients in office and 4% of patients in emergency department settings will be found to have headaches secondary to significant pathology.⁶

Clinical Scope of Headache

Recurrent headaches provoke consultation when they are debilitating, frequent, or associated with worrisome neurological or systemic symptoms. Episodic tension-type headache annually affects 38% of US adults, yet rarely requires medical attention given the typical absence of disability or concerning symptoms.^{7,8} Cluster headache generally leads to significant disability and assorted autonomic features, but it is uncommon in office practice due to low population prevalence (<0.1%).⁹ Migraine headache is disproportionately represented in office settings because of its high prevalence, significant disability, and strong association with neurological and gastrointestinal symptoms. A recent investigation has shown that more than

90% of initial headache consultations in a primary care office setting will involve patients experiencing attacks meeting International Headache Society (IHS) criteria for migraine, although only 3% experience solely episodic tension-type headache.¹⁰

Migraine, affecting 18% of women and 6% of men in the United States, remains underdiagnosed and undertreated. A recent population-based survey determined that fewer than half of those experiencing headaches meeting criteria for migraine have been diagnosed.² Insufficient clinical training may be a factor, because only 48% of internal medicine and 62% of family practice residency graduates report being very prepared to treat patients with headache.¹¹ It is thus not surprising that the majority of undiagnosed migraineurs are actually given alternative diagnoses, with 42% labeled as sinus headache and 32% labeled as tension headache.² The most important variable in misdiagnosis is in fact the self-diagnosis provided by the patient. A critical reappraisal of the methods of identifying migraine in the outpatient population is clearly warranted.

Diagnostic Steps in Headache

Headache may arise from conditions that range from benign to catastrophic. The initial step in headache assessment requires screening for secondary origins. A thorough history combined with general and focused neurological examinations are mandatory. Neuroimaging procedures or analysis of serum or cerebrospinal fluid is required when one of the red flags of secondary headache presentations is encountered (BOX 1).¹² The available data are insufficient to recommend ei-

ther computed tomography or magnetic resonance imaging as a more sensitive modality. The routine use of electroencephalography in the evaluation of headache patients is no longer warranted.¹³

Once secondary origins of headache have been excluded, it is next helpful to divide primary headaches into episodic and chronic headache disorders. The term *chronic* is applied by the IHS to those conditions involving attacks occurring more frequently than 15 days per month for more than 6 months.¹⁴ More than 4% of the US adult population report chronic daily headache.⁴ The majority have chronic forms of either migraine or tension-type headache.⁴ The pathophysiological basis for the transformation of episodic tension-type or migraine headache into their more chronic forms is not well understood. Physical or emotional trauma, major life change, surgery, and female hormone changes may act as catalysts. Often these patients are overusing acute headache medications, decongestants, muscle relaxants, sedatives, or anxiolytics, which may perpetuate the headache disorder. Comorbid depression, anxiety, insomnia, fibromyalgia, and significant headache-related disability may all require attention. Due

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to these factors, chronic daily headache is therapeutically challenging and the most common consultation in specialty headache clinics.

The majority of patients in primary care settings will experience episodic primary headache disorders.^{5,10} Traditional diagnosis is founded on a symptom-based paradigm initially developed by the IHS for purposes of clinical research.¹² Significant symptom overlap between the primary headaches has raised concerns regarding the clinical specificity of such a system.

Tension-type headache is the least distinct of the primary syndromes, defined by the absence of associated features.³ The pain is mild or moderate in intensity, generally bilateral, and nonpulsatile. It typically remains unchanged or improves with physical activity. Stress is listed as the most common trigger. Due to its limited disability, episodic tension-type headache rarely is the basis for consultation in primary care or specialty settings.

Episodic cluster headache is distinguished by its distinctive temporal pattern of grouped headache attacks recurring over several weeks or months.⁷ The episodes are characterized by minutes-to-hours of intense unilateral periorbital pain associated with nasal or ocular autonomic features. Due to its low population prevalence, cluster headache is also an infrequent consultation in primary care.

Given the significant underdiagnosis of migraine, the clinical applicability of a symptom-based diagnostic system has been called into question.¹⁵ The characteristics of migraine attacks vary both among patients and among episodes within a single patient. Although the pain of migraine is typically considered to be unilateral and throbbing, 40% of migraineurs may present with bilateral pain and half with nonpulsatile pain. Recent data have shown that 46% of migraineurs in a headache clinic setting describe cranial autonomic features, such as tearing or nasal congestion, symptoms often assigned to sinus headache.¹⁶ New research on patients with recurrent si-

Box 1. Red Flags for Secondary Headache Disorders

1. Fundamental change or progression in headache pattern
2. First and/or worst headache
3. Abrupt-onset attacks, including those awakening one from sleep
4. Abnormal physical examination results (general or neurological)
5. Neurological symptoms lasting >1 hour
6. New headache in individuals aged <5 years or >50 years
7. New headache in patients with cancer, immunosuppression, pregnancy
8. Headache associated with alteration in or loss of consciousness
9. Headache triggered by exertion, sexual activity, or Valsalva maneuver

nus headache in a primary care setting has shown that approximately 90% will experience attacks meeting IHS diagnostic criteria for migraine.¹⁷ Another study has shown that 75% of migraineurs report neck pain with their attacks, a feature thought to be more typical of tension headache.¹⁸ The inherent variability of migraine pain (location, description), triggers (barometric pressure changes, stress), and associated features (autonomic symptoms, neck pain) may help explain the underdiagnosis and misdiagnosis of migraine when the model for headache diagnosis is symptom-based.

As a result of the deficiencies of such a model, alternative migraine recognition instruments have been proposed, with varying degrees of validation.¹⁵ Pattern-based and impact-based recognition models are appealing because episodic disabling headache in the absence of red flags, daily headache, and analgesic overuse is almost invariably migraine. An instrument known as the Brief Headache Screen has been validated in a primary care setting as correlating well with IHS criteria for migraine and a modified 4-question version has been adopted by the American Academy of Neurology^{19,20}: (1) How often do you get severe headaches? (2) How often do you get other (milder) headaches? (3) How often do you take headache relievers or pain pills? and (4) Has there been any change in your headaches over the past 6 months?

Management of Primary Headache

Secondary headaches are managed through treatment of the underlying pa-

thology. Because a variety of headaches have been shown to improve following triptan delivery, response to treatment should not be used as a diagnostic tool for migraine or other primary headache conditions.²¹

Tension-type headache may be addressed with nonpharmacological strategies such as relaxation training, stress management, and counseling.⁷ When frequent, a trial of a tricyclic or a newer antidepressant are warranted. No comparative data are available to recommend any specific agent. Acute attacks may be managed with simple or combination analgesics, limited to 2 to 3 days per week to avoid medication-overuse headache. There is no evidence that muscle relaxants are effective in the treatment of episodic tension-type headache. In patients with chronic tension-type headache, a combination of amitriptyline hydrochloride and stress management proved more effective than either therapy alone.²²

Cluster headaches are often managed with short-term preventive agents such as corticosteroids or ergotamine tartrate during the initial 2 to 4 weeks.⁹ Long cluster episodes may require months of verapamil, methysergide, or lithium carbonate. First-line treatment of acute cluster headache is oxygen delivered at 7 to 12 L/min for 15 minutes. The only highly effective abortive agent is subcutaneous sumatriptan, with parenteral dihydroergotamine, intranasal sumatriptan, and intranasal lidocaine as alternatives.

Evidence-based guidelines are now available for the nonpharmacological and pharmacological management of

Box 2. American Academy of Family Physicians, and the American College of Physicians–American Society of Internal Medicine Recommendations for Migraine Management*

Acute Therapies

Use nonsteroidal anti-inflammatory drugs as first-line therapy:

- Aspirin (325-975 mg/dose by mouth)
- Ibuprofen (400-800 mg/dose by mouth)
- Naproxen sodium (375-550 mg/dose by mouth)
- Tolfenamic Acid (200-400 mg/dose by mouth)†
- Combination of acetaminophen + aspirin + caffeine (2 tablets per dose by mouth)

Use migraine-specific agents in nonsteroidal anti-inflammatory drug failures:

- Dihydroergotamine (0.5-1 mg/dose intranasal)
- Naratriptan (1-2.5 mg/dose by mouth)
- Sumatriptan (50-100 mg/dose by mouth, 6 mg/dose subcutaneous)
- Rizatriptan (5-10 mg/dose by mouth)
- Zolmitriptan (2.5-5 mg/dose by mouth)

Select nonoral route of administration for those with early or significant nausea or vomiting

Preventive Therapies

Recommended first-line agents:

- Amitriptyline (25-150 mg/d)
- Divalproex sodium (500-1500 mg/d)
- Propranolol (80-240 mg/d)
- Timolol (20-30 mg/d)
- Sodium valproate (800-1500 mg/d)

*Adapted with permission from Snow et al.²⁴

†Not available in the United States.

migraine headaches. Following a comprehensive review of all placebo-controlled trials, the US Headache Consortium published evidence-based guidelines for acute and preventive therapies of migraine in a primary care setting.²³ Clinical guidelines based on these publications have been adopted by the American Academy of Family Physicians and the American College of Physicians–American Society of Internal Medicine (BOX 2).²⁴

The design of an effective treatment program begins with profiling both the headache condition and patient variables. Those patients with frequent or extremely debilitating attacks are candidates for prevention. Those patients with rapidly developing pain, migraine upon awakening, or prominent gastrointestinal symptoms may warrant nonoral routes of acute drug administration. Important patient variables include age, sex, child-bearing status, and medical conditions such as

hypertension and vascular disease. Depression, anxiety disorders, irritable bowel syndrome, and epilepsy are comorbidities of migraine, which should be considered in the design of a treatment program.

Evidence-based guidelines support the efficacy and tolerability of nonsteroidal anti-inflammatory drugs as first-line therapies for acute attacks. Patients who cannot tolerate nonsteroidal anti-inflammatory drugs or those who fail to achieve complete pain freedom in 2 hours are candidates for migraine-specific therapies. Serotonin 1B/1D agonists (triptans) and dihydroergotamine are the most effective agents in this category. Contraindications to migraine-specific drugs include significant vascular or cardiac disease, uncontrolled hypertension, and the uncommon hemiplegic and basilar migraine variants. There is no evidence to support the use of acetaminophen or butalbital compounds in migraine, and

little evidence to support the use of isometheptene compounds. Opioids should be reserved for those situations in which other acute therapies have failed or are contraindicated.

There are several strategies for the acute management of migraine. A model based on stratified care (treatment intensity matched to headache disability) demonstrates superiority over models based on step care (agent selection based on cost) or staged care (milder first-line and stronger second-line agents).²⁵ No data are available to analyze specific treatment schedules, but experts recommend limiting acute therapies to 2 days per week to avoid medication-overuse headache. The goals of acute therapy are to treat attacks rapidly, effectively, and consistently to reverse or prevent disability, minimize requirements for rescue medication, and optimize self-care. A growing body of evidence supports the early treatment of acute migraine headache while it remains in the mild phase.²⁶ Such an approach maximizes pain-free efficacy and minimizes adverse events and headache recurrence. Triptan treatment while migraine pain remains mild also results in substantially decreased total costs per treated attack.²⁷ Because the majority of migraineurs do not experience consistent complete relief with any individual treatment, a program providing 2 possible treatments may be both valuable and preferred over those regimens providing a single option for acute attacks.²⁸

Nonpharmacological strategies can be used alone or in combination with pharmacological therapies in the stabilization and prevention of migraine. Evidence is available to support recommendations for relaxation training, thermal or electromyogram biofeedback, and cognitive-behavioral therapy.²³ Small studies support modest efficacy of magnesium, riboflavin, and feverfew.²³ Regulation of sleep, meals, and exercise patterns; reductions of dietary and pharmacological stimulants; and trigger avoidance are also helpful nonpharmacological recommendations.

Pharmacological migraine-preventive agents are indicated in situations of headache frequency more than twice per week; contraindication to, failure of, or adverse effects from acute therapies; significant headache disability despite acute therapies; presence of unusual migraine syndromes (hemiplegic, basilar, prolonged aura, migrainous infarction); and patient preference. Goals of preventive therapy include reduction of attack frequency, severity, and duration. Improved responsiveness to acute treatments may also occur. Complete headache elimination is rarely achieved. Recommended first-line

agents for the prevention of migraine headache include certain β -blockers, tricyclic antidepressants, and anticonvulsants (Box 2). Clinical benefit may require 2 months to manifest and consideration should be given to tapering the drug following a 6-month period of relative stability. The overuse of acute medications (>2 days per week) must be avoided to ensure optimal effectiveness of preventive therapy.

Conclusion

Consensus exists regarding the importance of patient education in migraine.²⁴ Physicians should review the

biological basis and genetic underpinnings of the sensitive nervous system responsible for migraine. A discussion of the risks, benefits, and realistic expectations from acute and preventive medications is imperative. Encouraging active participation in care through lifestyle suggestions and headache calendar completion is useful. Diaries documenting headache events, triggers, and response to treatments are indispensable in monitoring progress on a regular basis. Successful outcomes often arise from a vigorous therapeutic partnership between patient and physician.

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