

Clinical Features of Migraine and Other Headache Disorders

NORMAN GORDON, MD

INTRODUCTION

While the best recognized manifestation of migraine is headache, not all headaches presenting to physicians are migraine, and migraine disorder is not just a headache. Migraine is a complex and not fully understood process of cerebral dysfunction associated with a variety of symptoms uniting cortical depolarization, brainstem dysfunction, meningeal vasodilatation and excitation of sensory pain structures as remote as the cervical nucleus caudalis. This gives rise to the often seen myriad of symptoms, seeming somewhat disparate in this common disorder. I will attempt to explain at least some of the known and less well-known aspects of this fascinating disorder, including pathogenesis, management and treatment. I will also briefly discuss some of the lesser-known and often misdiagnosed headache syndromes.

Migraine without aura

About 75% of migraine occurs without aura, a phenomenon thought clinically related to the experimental phenomenon of cortical spreading depression of neuronal activity. However, even in migraine without aura, PET studies suggest that depolarization can occur in unilateral or bilateral occipital cortex (or cortices).¹⁻³ The headache of migraine is often unilateral and throbbing, accompanied by nausea, vomiting, photophobia, sonophobia (phonophobia), scalp hypersensitivity or hyperalgesia, and aggravated by movement and sensitivity to strong scents. It is commonly triggered by hormonal changes, atmospheric changes, sleep deprivation, hunger, alcohol, various vasoactive drugs and food additives and emotional events either positive, or more often, negative. Excessive stimulation by light, noise, strong scents and movement are both triggers and exacerbating factors. The prodrome of migraine can be characterized by dysphoria, fatigue with yawning, and other nonspecific symptoms that can precede the headache by hours or days. The headache itself typically lasts some hours and is then succeeded by postdromal fatigue, dulled senses, dysphoria or, conveniently termed, the 'migraine hangover.'

Migraine aura

The aura is by far the most interesting aspect of migraine. The migraine aura usually precedes the headache and lasts 15 to 30 minutes. The most well recognized and common auras are visual and may be described by migraine sufferers

as unilateral crescents, or expanding, jagged regions of shimmering light, leaving behind a scotoma. The terms fortification spectra, haloes, zigzags and scintillating scotomata are often used. Sensory auras of parasthesias, vertigo, as well as aphasias and motor hemiparesis are less frequently seen, but almost always have the same migratory nature of the visual aura. The mechanism of the aura is known to be spreading cortical neuronal depolarization demonstrated on PET scan, associated with subsequent hyperpolarization leading to the negative signs and symptoms such as the blind spot, hemi-anesthesia, and rarely hemiplegia.

The previously termed "Basilar Artery Migraine" is a migraine aura in which the deficits appear to be in a basilar artery distribution. This particular aura syndrome, the most striking of migraine auras, is associated with brainstem dysfunction, including bilateral visual loss, vertigo, dysarthria, ataxia, tinnitus, hearing loss, global parasthesias, altered consciousness, and finally, syncope. Autonomic changes such as flushing, anhidrosis, ptosis, midriasis, pulse and blood pressure changes and diarrhea can occur. Other auras deserving mention are other episodic conditions – abdominal migraine, cyclic vomiting and episodic ataxia. These conditions are more common in children and eventually evolve into more typical migraine with and without aura, as they mature into adulthood.

Acephalgic migraine is aura without headache and is more prevalent with aging as the incidence of migraine headache recedes. Often, these auras are identical to auras that the patient may have experienced with typical headache in the past, but they may occur a priori. They are often described with the typical features of migraine aura, such as visual obscurations in one hemifield, lasting 15 to 30 minutes, but always need further evaluation like an MRI, and EEG because they do raise a red flag as a NEW phenomenon.^{2,3}

Migraine and stroke risk

There is evidence that the association between migraine with aura and stroke is real – however small – and likely related to contributing factors of smoking, oral contraceptive use, and age under 45.^{4,5} The incidence of small, nonspecific, white matter lesions on MRI is higher in migraine sufferers but of unclear clinical significance. However, white matter lesions are also seen in patients known to have microvascular or ischemic cerebral disease, among other conditions.

Treatment of migraine

The treatment of migraine consists of preventative and abortive therapy. Patients experiencing infrequent, episodic migraine responding to effective abortive treatment do not require prophylaxis. The goal of preventative treatment is to reduce not only the frequency but also the severity of the attacks. Prophylactic medications often potentiate the effect of abortive medications.

Preventative treatment

First-line prophylaxis does not necessarily involve the choosing of one or more of the many agents available, but rather education and lifestyle changes. Regular sleep, food, fluids and exercise are the mantra of headache hygiene. Identification and avoidance of obvious triggers is free, convenient and devoid of side effects. Preventative agents⁶⁻⁸ include beta blockers, calcium channel blockers, ACE inhibitors, Tricyclic antidepressants (TCAs), and NSAIDs. Anticonvulsants, considering a mechanism of action to inhibit spontaneous cortical depolarization, may make the most sense as first-line agents. Over the counter products such as feverfew, magnesium, riboflavin, CoQ10 and butterbur have all been somewhat supported by various, usually small clinical trials, but may be preferred by certain patients who are more favorably disposed to nontraditional methods. The American Academy of Neurology released guidelines in 2012 regarding the use of prophylactic and abortive migraine therapies, and included these supplements as having some data to support their use.

Migraine sufferers often respond to lower doses of preventive agents such as the anticonvulsants and TCAs than doses that are usually required to control epilepsy or depression. This tactic may minimize side effects and expense. Mention should be made of botulinum toxin, indicated for the treatment of chronic migraine (defined as greater than fifteen headache days per month) and administered every three months.

Abortive treatment

The most effective abortive treatment for migraine is the one that works. In other words, there is no clinical way to predict in advance a response to a particular migraine treatment. Any medication administered orally, as nasal spray, injection, patch, or rectally that not only aborts the headache, but also restores normal function within 1 to 2 hours, without unwanted side effects, can be an effective agent. Most of the abortive agents relieve the headache only. The prodrome, aura, and associated features dissipate either spontaneously or as a result of effective pain control. The triptan medications in all their forms are clearly the most effective agents, particularly when given as soon as possible in the migraine process, and in a dosage form appropriate for that individual. Oral agents in a patient who is vomiting may be useless, and in these patients, nasal sprays, injectables, or a patch is preferred. Triptans⁶⁻⁸ are serotonin (5-HT

1B and D) agonists, and cause a degree of vasoconstriction in meningeal vessels, as well as other vascular beds, eliminating the pain caused by vasodilatation. However, they are not expected to directly terminate the various sensitivities of migraine, the nausea or vomiting, or affective components such as irritability.

NSAIDs and Tylenol⁶⁻⁸ are often effective in early and milder migraine and can also be used safely in conjunction with triptans. Anti-emetics are effective adjuvant treatments and often used intravenously in appropriate settings such as the emergency room. Currently, the only ergot available is parenteral or nasal dihydroergotamine (DHE), a useful alternative to triptans, particularly in the emergency room, though this medication is subject to the same limitations in patients prone to vascular complications, and may cause nausea and vomiting itself. Dexamethasone and prednisone are particularly useful in the treatment of status migrainosus, defined as a migraine occurring without remission for more than 72 hours. Opioids and other potent analgesics such as tramadol can be used as rescue medications but are sedating and usually do not restore normal activity within two hours as desired.

Calcitonin G related peptide (CGRP) inhibitors and serotonin 1F receptor agonists are novel agents, which unfortunately in clinical trials have had either unacceptable adverse events, or other limitations despite showing efficacy, and none is at this time in a realistic pipeline.

Trigemino-Autonomic Cephalgia (TAC)

Other interesting headache syndromes aside from migraine comprise a list that is far too extensive for the purposes of this article; however, some of these bear mentioning. The most familiar is cluster headache,^{9,10} which is characterized by brief (15-180 minutes) bouts of severe pain in the periorbital region, often accompanied by conjunctival injection, tearing, nasal congestion or rhinorrhea, eyelid edema, forehead and facial sweating, miosis, ptosis and or a sense of restless or agitation. Treatment involves inhaled high-flow nasal oxygen or triptan medications. Lesser known to the general practitioner are some other Trigemino-Autonomic Cephalgias (TACs), a group of unilateral, severe, periorbital headaches associated with autonomic features. Of these, the two most interesting are Hemicrania Continua,^{9,10} and the chronic and episodic forms of Paroxysmal Hemicrania. Hemicrania continua is a unilateral, continuous headache which does vary in intensity without complete resolution. It affects the sexes equally; location is often peri-orbital but also may the entire hemicranium. It is unusual to be associated with the usual migraine accompaniments and in contradistinction, is frequently associated with autonomic features such as tearing, miosis, and ptosis. While typical response to triptans is poor, a unique response to indomethacin is diagnostic. Chronic and episodic paroxysmal hemicranias also involve periorbital pain, but are associated with autonomic features – predominantly parasympathetic – such

as redness, swelling and tearing. The attacks last between 5 and 30 minutes and occur more than five times a day. They are distinguished from cluster headaches, which usually last longer, and have the characteristic of often occurring after dark and fewer times per day. The pain is also described as stabbing and boring. This condition is more common in women, while cluster headache is more common in men. Again, the other remarkable distinguishing feature is an exquisite response to indomethacin at a dose of 75 mg a day or more.

The chronic form may last a year without remission, whereas the episodic form may remit for months at a time. Rarer forms of TACs include SUNCT (short-lasting unilateral neuralgiform headache with conjunctival injection and tearing). Trigeminal neuralgia is an episodic facial pain syndrome and is not generally considered a headache disorder. Giant cell (temporal) arteritis should be excluded in elderly patients presenting with new onset of headache.

SUMMARY

Migraine disorder is not just a headache, but a relatively common and complex neurovascular syndrome, occurring in about 17% of women and 6% of men. The effects of migraine can be debilitating and disabling but can be effectively treated by a combination of non-pharmacological, lifestyle changes, pharmacological prophylaxis, and appropriate abortive treatment. Trigemino-Autonomic-Cephalgias are an interesting and less common group of primary head pain disorders which, if recognized clinically, may respond to a unique set of treatments – including inhaled nasal oxygen (cluster headache) or a trial of indomethacin, which can be diagnostic as well.

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Author

Norman Gordon, MD, Neurologist, The Miriam Hospital, Providence, RI; Clinical Associate Professor of Neurology, Warren Alpert Medical School, Brown University.

Correspondence

Norman Gordon, MD
East Side Neurology, Inc.
450 Veterans Mem. Pkwy, Bldg. 11
East Providence, RI 02914
401-431-1860
Fax 401-435-0328