

Sinus Headache or Migraine?

Keys to Correct Diagnosis

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Patients often complain of “sinus” headache. However, many patients and physicians do not realize that the symptoms of sinus headache—facial pain, nasal congestion, rhinorrhea—often occur in migraine. In fact, in many cases “sinus” headache actually turns out to be migraine, according to the guidelines established by the International Headache Society. Thus, many headache patients are improperly treated and do not experience relief from their troublesome symptoms. Migraine-specific medications, such as the triptans, and lifestyle changes can often successfully treat these patients.

Sinus complaints occur frequently in primary care patient encounters. Some patients may request an antibiotic, citing the presence of nasal congestion and facial pain; they may remark that an antibiotic will “clear up” their symptoms in a few days. But since there is often no purulent phlegm or fever, for most patients an antibiotic is not the answer. Other patients may complain of “sinus” headache and request decongestants, nasal sprays, antihistamines, or a referral to an ear, nose, and throat (ENT) specialist or allergist. Some patients may even request a narcotic, due to the severity of their “sinus” headache. In many cases, follow-up reveals incomplete resolution of these headaches.

A headache that appears to the patient—and even to the clinician—to be a sinus headache may in fact be a migraine. The large, population-based American Migraine Study II maintained that only about half of the estimated 28 million people with headache that fit the International Headache Society (IHS) criteria for migraine had actually been diagnosed with migraine.¹ Among the nearly 30,000 study participants, analysis of those who were undiagnosed revealed that 42% considered their headache to be “sinus” headache. The study further identified these “sinus” headache sufferers

as meeting IHS criteria for migraine.

This article reviews the IHS classification of migraine versus sinus headache and describes the symptoms and pathophysiology of each to assist clinicians in differentiating between the two. Treatment options for migraine with sinus symptoms are also discussed.

CLASSIFICATION

To help alleviate the confusion between sinus and migraine headache, it may be helpful to explain how headaches are classified, so that their differences can be better understood.

In 1962, an ad hoc committee was formed through the NIH; this group went on to develop a headache classification system. In 1982, the IHS was formed; the Classification Committee for that headache society was charged with creating a headache classification system that would be recognized worldwide. This led to the International Classification of Headache Disorders (ICHD I), which was published and recognized in 1988. It was translated into all major languages and has unified headache clinicians and researchers worldwide through a common “language” for classifying headache disorders for both clinical and research purposes. The headache classification system was revised recently over a five-year period (1999–2004) and is now known as ICHD II. The complete ICHD II can be found in the journal *Cephalalgia*.²

While the entire classification system may not be practical to use in a busy primary care setting, there

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PRIMARY
POINTS

Is It Sinus Headache or Migraine?

- The presence of sinus symptoms should not preclude the diagnosis of migraine. Sinus symptoms, such as lacrimation and nasal congestion, often accompany migraine.
- Sinus headache is not a primary headache: It occurs secondary to sinusitis.
- Vasoconstriction and vasodilatation are important components of migraine. Activation of the trigeminal nerve and the trigeminal nucleus caudalis also play a significant role.
- If a patient's sinus/autonomic symptoms are determined to be part of the migraine process, she may be appropriately treated with a migraine-specific medication, as well as with lifestyle changes.

are several reasons why it is important that clinicians be familiar with the basics of this system. It creates a scientific way of diagnosing the headache a patient presents with; instead of using the vague diagnosis of "headache," it is now possible for clinicians to be more specific about the type of headache. Making a more definitive diagnosis can greatly help with treatment decisions. Understanding some of the basics of ICHD II can also facilitate better communication between the primary care clinician and the headache consultant. Lastly, the ICHD II makes it possible to have uniformity of headache diagnosis in headache studies, as well as collaboration on headache studies by researchers worldwide. The ICHD II criteria have been adopted by the FDA, NIH, and the World Health Organization.

The ICHD II categorizes headache as follows: Part 1 classifies primary headache, part 2 classifies secondary headache, and part 3 classifies cranial neuralgias, central and primary facial pain, and other headaches. Most headaches are considered either primary or secondary and can be further diagnosed based on history and symptoms.

Migraine Versus Sinus Headache

Primary headache indicates that the headache is the primary problem; there are no secondary causes, such as brain tumor. With primary headache, there are no laboratory markers or positive signs from an imaging test; the diagnosis is best made by a careful history and physical examination. Primary headache, as classified in

part I, includes migraine, tension-type, cluster, and other types of primary headache, such as exertional headache.² The IHS diagnostic criteria for *migraine headache without aura*, often referred to as *common migraine*, and for *migraine headache with aura*, also known as *classic migraine*, are listed in Table 1.

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A useful, less well-known migraine classification in the ICHD II criteria (Table 2) is *probable migraine*, which under the old ICHD I criteria was known as *migrainous headache*.

A *secondary headache* is a headache attributed to another condition, such as a brain tumor, trauma, infection, or vascular disorder. Clinical evidence, laboratory markers, or positive signs from imaging tests should be present. The ICHD classifies secondary headache based on the cause of the headache. Categories for secondary headache in the ICHD II include head/neck trauma; cranial/cervical vascular disorders; nonvascular intracranial disorders, such as idiopathic intracranial hypertension; headache attributed to substance abuse/withdrawal; infection; or headache attributed to disorder of the cranium and ENT system.

Sinus headache is not classified as a primary headache. The IHS recognizes acute sinus headache as a secondary headache in the ICHD II. It must occur

TABLE 1. ICHD-II MIGRAINE CRITERIA

1.1 Migraine without aura (often referred to as *common migraine*)*At least five attacks fulfilling the following four criteria:*

1. Headache attacks lasting four to 72 hours (untreated or unsuccessfully treated).
2. Headache has at least two of the following characteristics:
 - Unilateral location
 - Pulsating quality
 - Moderate or severe pain intensity
 - Worsens with or causes avoidance of routine physical activity (eg, walking, climbing stairs)
3. During headache, at least one of the following symptoms is present:
 - Nausea or vomiting
 - Photophobia and phonophobia
4. Headache cannot be attributed to another disorder

1.2.1 Typical aura with migraine headache (often referred to as *classic migraine*)*At least two attacks fulfilling the following criteria:*

1. Aura consisting of at least one of the following, but no motor weakness:
 - Fully reversible visual symptoms including positive features (eg, flickering lights, spots, or lines) and/or negative features (eg, loss of vision)
 - Fully reversible sensory symptoms including positive features (eg, pins and needles) and/or negative features (eg, numbness)
 - Fully reversible dysphasic speech disturbance
2. At least two of the following:
 - Homonymous visual symptoms and/or unilateral sensory symptoms
 - At least one aura symptom developing gradually over at least five minutes and/or different aura symptoms occurring in succession for more than five minutes
 - Each symptom lasts at least five minutes and no more than 60 minutes
3. Headache fulfilling all four criteria for *1.1 Migraine without aura* begins during the aura or follows the aura within 60 minutes
4. Headache cannot be attributed to another disorder

Adapted from Headache Classification Subcommittee of the International Headache Society.²

with acute sinusitis; diagnostic criteria for the IHS classification *headache attributed to rhinosinusitis* are presented in Table 3.²

SINUS SYMPTOMS IN MIGRAINE

Migraine symptoms such as nausea, photosensitivity, and aura are well recognized. What is not appreciated is how common sinus symptoms are with migraine. Facial pain and autonomic symptoms, such as lacrimation and nasal congestion, are not listed in the ICHD II criteria for migraine. Therefore, many clinicians do not think of migraine when sinus symptoms are present; we have not been taught to do so. Several studies demonstrate the presence, frequency, and disabling nature of sinus symptoms in migraine.

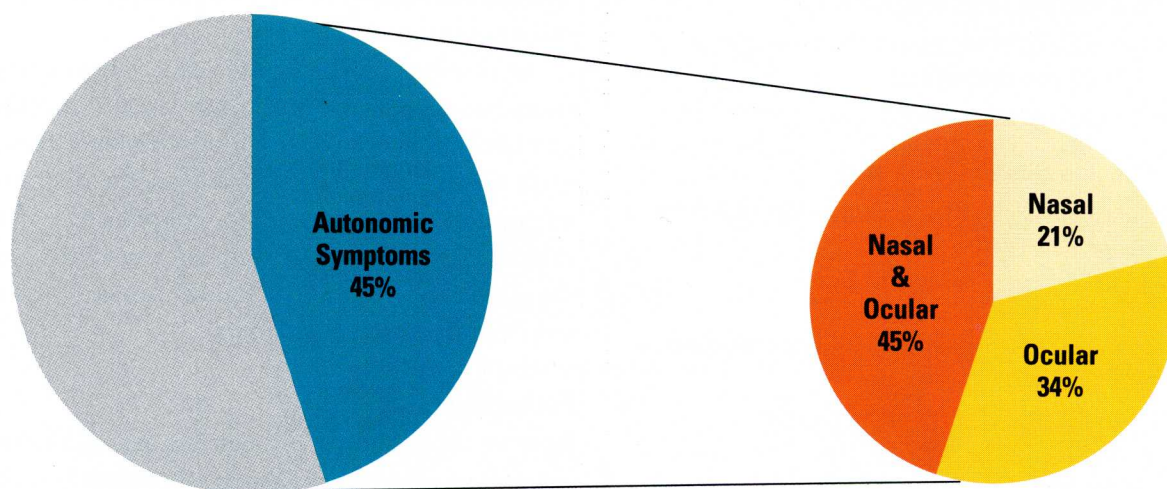
In one study looking at the percentage of migraineurs with autonomic symptoms, 177 consecutive migraine patients at a headache clinic were interviewed to determine the presence of autonomic symptoms, defined as lacrimation, eye redness, ptosis, eyelid edema, nasal congestion, and rhinorrhea. Participants who had a diagnosis of migraine with or without aura were included in the study. Significantly, 45% of patients had

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at least one autonomic symptom during their migraine attacks. Of this subgroup, 21% had only nasal symptoms, 34% had only ocular symptoms, and 45% had both nasal and ocular symptoms (Figure 1).³

How common is “sinus” headache migraine? A small pilot study with 47 participants conducted in 2001 suggested that patients with self-diagnosed “sinus” headache often met the criteria for migraine. To be entered into the study, these patients could not have been previously diagnosed as having migraine. Detailed headache histories demonstrated that 98% of participants met the criteria for migraine-type headache.⁴ From this group, 70% fulfilled the ICHD criteria for migraine with or without aura; another 28% met the criteria for migrainous headache (ie, *probable migraine* under ICHD II). Symptoms reported included moderate or severe pain (98%), nasal stuffiness

FIGURE 1. NASAL AND OCULAR SYMPTOMS CAN ACCOMPANY MIGRAINE ATTACKS



45% of patients had at least one autonomic symptom during migraine attacks.

Of these:

- 45% had both nasal and ocular symptoms.
- 21% had only nasal symptoms.
- 34% had only ocular symptoms.

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(74%), photophobia (72%), unilateral head pain (70%), pain worsened by activity (68%), nausea (64%), runny nose (60%), pulsating head pain (57%), phonophobia (49%), weather-associated headache (45%), and vomiting (21%).

Some of these symptoms are clearly autonomic; therefore, the prestudy diagnosis of “sinus” headache makes sense. However, other frequently reported symptoms, such as moderate/severe pain, photophobia, unilateral pain, and pain worsened with activity, would indicate migraine. This study suggests that autonomic symptoms often lead patients to think that they have “sinus” headache when in fact they meet the ICHD criteria for migraine.

A large-scale, prospective, observational study helps to shed light on how commonly migraine is misdiagnosed as “sinus” headache. In this research, 2,991 patients at 452 North American primary care study sites were screened for sinus headache.⁵ Criteria for screening included a six-month history of at least six self- or physician-diagnosed “sinus” headaches. These “sinus” headache patients had never been diagnosed as having migraine and had never been treated with a triptan prior to study entry. Patients were excluded if they had evidence of acute sinusitis. Of the 2,991 patients with recurrent “sinus” headache, 2,396 (80%) were diag-

nosed at the clinic visit as meeting the criteria for migraine without aura or migraine with aura. An additional 8% of the original sample met IHS criteria for probable migraine. Therefore, 88% of this large group of “sinus” headache patients were diagnosed with migraine-like headache.

The presenting symptoms of patients meeting the criteria for migraine with and without aura in this sinus headache study included moderate/severe pain (97%), pulsing/throbbing (89%), headache worsened by activity (85%), photophobia (79%), nausea (73%), phonophobia (67%), unilateral pain (57%), aura (28%), and vomiting (24%).

Symptoms referable to the sinus area were sinus pressure (84%), sinus pain (82%), nasal congestion (63%), rhinorrhea (40%), watery eyes (38%), and itchy nose (27%).

During the clinic visit for this sinus headache study, patients also completed a six-question Headache Impact Test (HIT-6) to measure the impact of their headaches on their functional ability. The HIT-6 is a well-recognized headache disability assessment tool that has been shown to be reliable and valid.⁶ Total scores can range from 36 to 78; the higher the score, the more disabling the headache. A score of 60 or above reflects significant headache disabili-

TABLE 2. ICHD II “PROBABLE MIGRAINE” CRITERIA

1.6.1 Probable migraine without aura

- Attacks fulfilling all but one of the four criteria for 1.1 Migraine without aura
- Not attributed to another disorder

1.6.2 Probable migraine with aura

- Attacks fulfilling all but one of the four criteria for 1.2 Migraine with aura
- Not attributed to another disorder

Adapted from Headache Classification Subcommittee of the International Headache Society.²

TABLE 3. ICHD II DIAGNOSTIC CRITERIA FOR SINUS HEADACHE

11.5 Headache attributed to rhinosinusitis

1. Frontal headache accompanied by pain in one or more regions of the face, ears, or teeth and fulfilling criteria 3 and 4 below.
2. Clinical, nasal endoscopic, CT and/or MRI, and/or laboratory evidence of acute or acute-on-chronic rhinosinusitis. (Clinical evidence may include purulence in the nasal cavity, nasal obstruction, hyposmia/anosmia, and/or fever.)
3. Headache and facial pain develop simultaneously with onset or acute exacerbation of rhinosinusitis. (Chronic sinusitis is not validated as a cause of headache or facial pain unless relapse into an acute stage occurs.)
4. Headache and/or facial pain resolves within seven days after remission or successful treatment of acute or acute-on-chronic rhinosinusitis.

Adapted from Headache Classification Subcommittee of the International Headache Society.²

ty. The average HIT-6 score for the 2,396 patients who met IHS criteria for a migraine diagnosis was 62.8. This score reflects a very severe impact of these self- or physician-diagnosed “sinus” headaches—the diagnosis prior to entry into the study—on functional ability.⁵

It is interesting to note that migraine was commonly diagnosed among patients referred to an ENT practice for “sinus” headache. One study looked at 100 such patients and found that nearly one out of two received a migraine diagnosis.⁷ Evaluations included a medical history, ENT history and examination,

headache history, and photodocumented nasopharyngoscopy. Specifically, 49% of these patients were diagnosed as having migraine, based on IHS criteria; 51% had a nonmigraine diagnosis.

In summary, patients often experience sinus pain, sinus/facial pressure, and other sinus symptoms as part of their migraine, and headaches with these features are disabling. It appears that the diagnosis of migraine is often missed in the presence of sinus symptoms. Primary care clinicians need to consider the clinical presentation of “sinus” headache as a common manifestation of migraine.

Pathophysiology

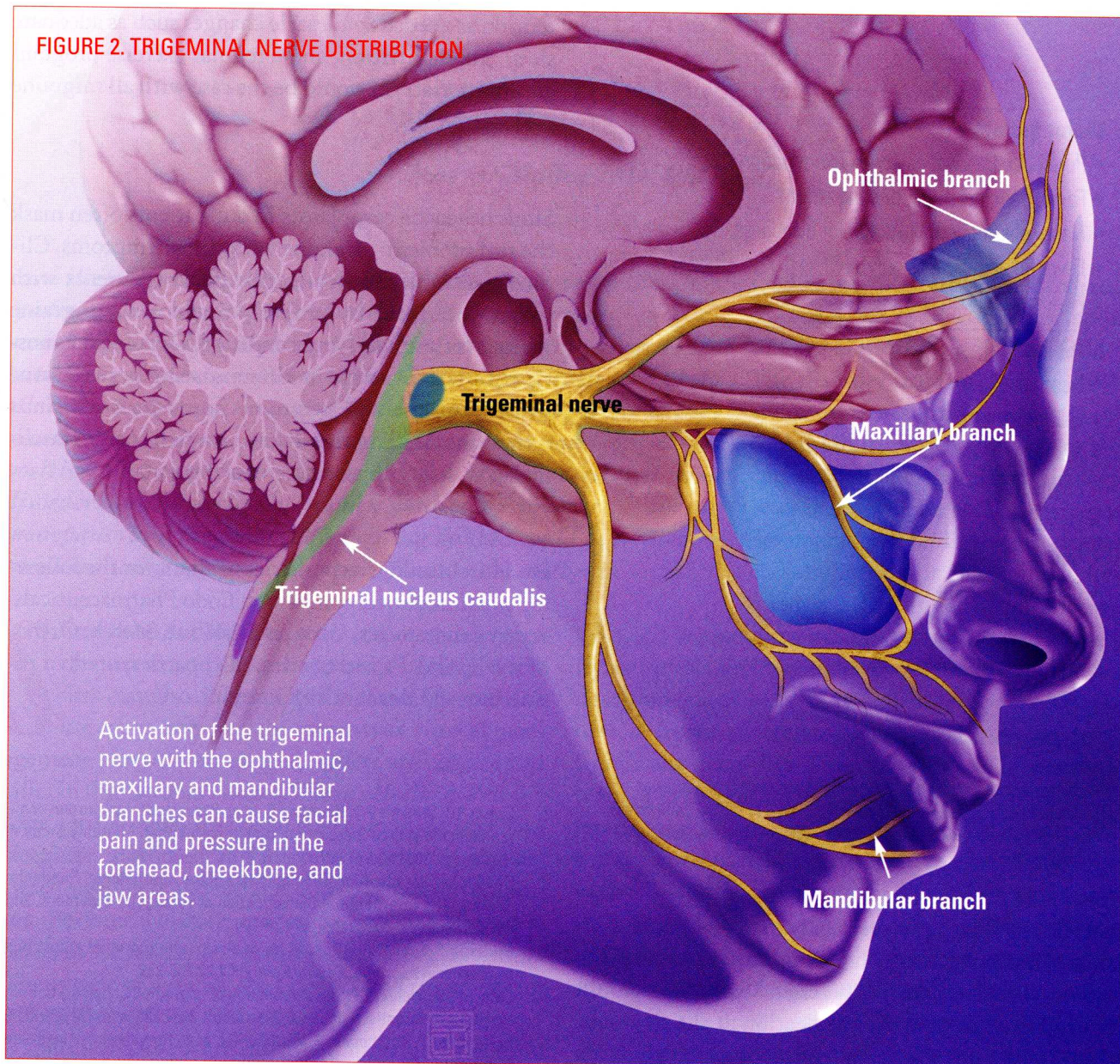
New advances in the understanding of migraine pathophysiology help explain the facial pain and autonomic symptoms that patients describe. In medical training, many physicians were taught that migraine had a vascular etiology; an initial period of vasoconstriction was followed by vasodilatation. The vasoconstriction was presumed to be the cause of the aura; the vasodilatation, the cause of the throbbing or pulsatile feature of migraine, the so-called vascular headache. Key to our new understanding of the pathophysiology of migraine is to appreciate involvement of the trigeminal nerve and the trigeminal nucleus caudalis (TNC) as becoming activated with the migraine process.^{8,9} The TNC is the part of the brain stem where the trigeminal nerve makes its connection.

Activation of the trigeminal nerve (fifth cranial nerve) with the ophthalmic, maxillary, and mandibular branches can cause facial pain and pressure in the forehead, cheekbone, and jaw areas (Figure 2). Involvement of the parasympathetic nervous system via the superior salivatory nucleus and brain stem activation can explain the nasal congestion and watery, itchy eyes.

DIAGNOSIS

How can the clinician determine whether the patient has sinus or migraine headache? If a patient presents with sinus symptoms, the first step is to check for a sinus condition such as acute sinusitis. Taking a careful history, performing a targeted physical examination concentrating on the eyes and ENT system, and checking for fever are reasonable first steps. If there is no fever, purulent phlegm, or nasal obstruction, then it is appropriate to evaluate the patient for an underlying cause for her symptoms, such as a migraine condition.

FIGURE 2. TRIGEMINAL NERVE DISTRIBUTION



To rule out sinusitis as the cause of the patient's complaint of "sinus" headache, see the list of major and minor diagnostic factors in Table 4. MRI, CT, or laboratory studies may be useful if sinus pathology is suspected or if the diagnosis of sinusitis is unclear. It is helpful to note that the American Academy of Otolaryngology–Head and Neck Surgery lists headache as a minor symptom of acute sinusitis; it is not a validated symptom for chronic sinusitis.¹⁰

To support a migraine diagnosis, look for the following: recurrent disabling headache, nausea, photophobia, and predictable triggers such as menses or weather changes.

It is useful to consider the primary headache diag-

nosis of *probable migraine* when a patient presents with a moderate to severe throbbing headache that worsens with activity but is not associated with nausea, photophobia, or phonophobia.

TREATMENT

If a patient meets the criteria for migraine with sinus symptoms, treatment is the same as for any migraine. For mild to moderate migraine, NSAIDs may be a good initial treatment choice. If the migraine is associated with moderate to severe disability and the patient is dissatisfied with current treatment, it would be reasonable to initiate a migraine-specific medication such as a triptan. Instructing the patient to take a migraine-

TABLE 4. AAO-HNS DIAGNOSTIC FACTORS IN RHINOSINUSITIS**Major factors**

- Purulence in nasal cavity on examination
- Facial pain, pressure, or congestion*
- Nasal obstruction, blockage, or discharge
- Fever (in acute cases only)
- Hyposmia/anosmia

Minor factors

- Headache
- Fever (chronic)
- Halitosis
- Fatigue
- Dental pain
- Cough
- Ear pain/pressure/fullness

AAO-HNS, American Academy of Otolaryngology–Head and Neck Surgery. Also adopted by the American College of Allergy, Asthma and Immunology.

* Facial pain/pressure alone does not constitute a suggestive history for rhinosinusitis in the absence of another major nasal symptom or sign.

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specific medication for her next three “migraine with sinus symptoms” headaches is an option; ideally, the patient would also keep a headache diary. She should be instructed to take the medication at the first sign of headache pain; this early-treatment approach yields greater pain-free results. The commonly accepted clinical end point is complete resolution of the headache and return to full function in two hours. To evaluate treatment results, a follow-up appointment should be scheduled within one to two months.

If the patient’s sinus/autonomic symptoms are part of the migraine process, then improvement of sinus symptoms and headache pain can be expected. Physician and patient review of the headache diary and at-

tention as needed to lifestyle changes such as adequate sleep, good nutrition, and a regular exercise program are appropriate, as would be the case with all migraine patients.

CONCLUSION

Sinus headache complaints in our patients often mask the real problem: migraine with sinus symptoms. Clinicians can better alleviate the pain of patients with “sinus” headache by properly diagnosing migraine when it is the underlying condition. Detailed diagnostic criteria exist to aid in differentiating between true sinus headache and migraine headache with sinus symptoms. Making this distinction will enable the clinician to select appropriate treatment. ♀

DISCLOSURES

Dr. Hutchinson is a speaker/consultant for the following pharmaceutical companies: Endo Pharmaceuticals, Forest Laboratories, GlaxoSmithKline, Merck, Ortho-McNeil, and Pfizer. She has also participated in research with GlaxoSmithKline.

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