

Expert Opinion

The Headaches That Awaken Us

Case History Submitted by Randolph W. Evans, MD

Expert Opinion by David W. Dodick, MD; Todd J. Schwedt, MD

Key words: sleep, headaches, hypnic headaches

(*Headache* 2006;46:678-681)

In this case, Shakespeare's Hamlet might have appealed, "To sleep: perchance to dream: and not to awaken with a headache."

CLINICAL HISTORY

A 56-year-old male with a history of well-controlled hypertension and episodic tension-type headache has been awoken from sleep 3 nights per month for the last 2 years between 1:00 a.m. and 2:30 a.m. with a moderately severe bifrontal pressing headache that persists for 1 to 2 hours untreated and 10 minutes if treated with a caffeine containing over-the-counter analgesic.

Questions: What is your diagnosis? Are there other medications, which might be beneficial?

EXPERT COMMENTARY

This case prompts one to consider a number of primary and secondary headache disorders that awaken people from sleep (Table 1). Many of these are easily excluded in this patient by their absence in the history. In this particular case, a space-occupying intracranial lesion is highly unlikely given the chronicity of the headaches over 2 years, the periodicity and infrequency with which they occur, and his normal neurological examination. Nondescript nocturnal or early morning headaches are common in patients with sleep

apnea. They occur with an incidence ranging from 36% to 58% and headache may be the presenting feature in this group of patients.¹⁻³ Although the incidence of hypertension is increased in patients with obstructive sleep apnea, there is little else in the history that would suggest this diagnosis as a possibility (obesity, diurnal fatigue and daytime hypersomnolence, cognitive impairment).

Primary headache disorders that may awaken patients from sleep are also listed in Table 1. Cluster headache and the paroxysmal hemicranias are short-lasting primary headache disorders (attack duration <4 hours) which are characteristically associated with nocturnal attacks. However, the headaches are almost exclusively unilateral, excruciatingly severe, occur multiple times during a 24-hour period with daytime attacks, and are associated with signature cranial autonomic symptoms (lacrimation, nasal congestion, rhinorrhea). Migraine attacks may occur during nocturnal sleep but typically last more than 4 hours and are accompanied by the characteristic symptoms of photophobia, phonophobia, and nausea. This patient does not meet International Headache Society (IHS) criteria for migraine or cluster headache.

The most likely diagnosis in this case is hypnic headache. Hypnic headache syndrome is a recurrent, benign headache disorder, which occurs exclusively during sleep and usually begins after the age of 50 years. This rare syndrome was first characterized by Raskin in 1988, when he described 6 patients who were

Address all correspondence to Randolph W. Evans, MD, 1200 Binz #1370, Houston, TX 77004.

Table 1.—Relationship Between Headache and Sleep

A. Headache as the result of disrupted nocturnal sleep or the underlying process, which disrupts sleep
1. Obstructive sleep apnea syndrome or nocturnal hypoxia/hypercarbia
2. Restless legs syndrome/periodic leg movements of sleep
3. Psychophysiologic insomnia
4. Chronic pain syndrome or fibromyalgia
5. Depression/anxiety
B. Primary headache disorder that occurs during nocturnal sleep
1. Migraine
2. Cluster headache
3. Chronic paroxysmal hemicrania
4. Hypnic headache

awakened regularly from nocturnal sleep by a short-lasting headache.⁴ Since then, at least 83 additional patients have been reported and the clinical spectrum has expanded along with the therapeutic options available.

Hypnic headache syndrome was originally described as a disorder confined to the elderly. The majority of patients present in the seventh decade, with a mean age of 63 years.⁵ Even so, a significant age range for onset of hypnic headache has been documented. Reports have included adults between the ages of 36 and 83 years and one child with onset at 9 years.⁵⁻⁸ Certainly, the age of onset in this case (56 years) is entirely compatible with a diagnosis of hypnic headache. Although 5 of the original 6 patients were men, the disorder appears to occur more commonly in women. Usually the headaches are short-lasting (30 to 60 minutes), bilateral, and of moderate to severe intensity, but approximately one third of the cases described to date are unilateral.^{6,8-12} In addition, the headaches may be severe in nature and last up to 4 hours. Individuals may have a previous or coexisting headache history, but hypnic headaches are infrequently associated with migrainous features (photophobia, phonophobia, nausea, vomiting) and are not accompanied by autonomic features (lacrimation, rhinorrhea, ptosis). Typically, patients prefer to sit up or stand, as continuing to lay supine may prolong or intensify the pain.^{6,13,14}

Hypnic headaches occur exclusively during sleep and only occur during daytime hours when associ-

ated with a nap. Some patients report being awoken from a dream with the headache then immediately present.^{6,12} In most patients, attacks occur between 1:00 and 3:00 a.m. or 4:00 to 6:00 a.m. and in some, the headache occurs with striking circadian rhythmicity with onset at the same time each night.^{4,6,9,12,15} This feature has earned it the title of the “alarm-clock headache syndrome.” In this case, the patient’s headaches occur between the hours of 1:00 a.m. and 2:30 a.m. He experiences rare headaches during waking hours that were qualitatively different than his hypnic headaches, and by description, represent tension-type headaches. In over two thirds of patients, the headaches occur with a high frequency of more than 4 nights per week and in some the attacks occur nightly. Patients usually experience only 1 headache attack per night, but some may have recurrent bouts of 2 or more headaches throughout the night, which repeatedly interrupt sleep. In this respect, the occurrence of hypnic headache only 2 to 3 times per month in this particular patient is somewhat atypical.

The syndrome appears to be durable. In one study, prospective follow-up of 17 patients revealed spontaneous resolution in only 1 patient.⁶ While headache frequency can vary over time, the intensity remains relatively constant or decreases over time. The average headache duration prior to diagnosis is approximately 7 to 8 years. There are no specific neurological abnormalities associated with hypnic headache. There have been 2 case reports of hypnic headache secondary to an underlying disorder; in one such case, obstructive sleep apnea was diagnosed and treatment with continuous positive airway pressure resulted in resolution of headaches, and in the second, the patient was found to have a posterior fossa meningioma.^{16,17} After removal of the meningioma, headaches disappeared.

In this particular patient, the headache resolved within 10 minutes after the administration of a caffeine-containing analgesic. Caffeine has been reported to be effective for this disorder, either taken prior to bedtime or after the headache begins.^{6,18} Caffeine may be taken in the form of a caffeine-containing analgesic or simply as a cup of coffee. In this case, since the patient only experiences attacks 2 to 3 times per month, symptomatic rather than prophylactic use of caffeine is certainly advisable.

Table 2.—IHS Criteria for Hypnic Headache

A. Dull headache fulfilling criteria B–D
B. Develops only during sleep, and awakens patient
C. At least 2 of the following characteristics:
1. Occurs >15 times per month
2. Lasts ≥15 minutes after waking
3. First occurs after age of 50 years
D. No autonomic symptoms and no more than 1 of nausea, photophobia, or phonophobia
E. Not attributed to another disorder

Other medications reported to be effective for hypnic headache include lithium, indomethacin, flunarizine, verapamil, atenolol, melatonin, pizotifen, cyclobenzaprine, gabapentin, clonidine, acetylsalicylic acid, ergotamine derivatives, acetaminophen, acetazolamide, and prednisone.^{4-6,8-16,18-22}

The diagnosis of hypnic headache is based on the clinical features. Diagnostic criteria were initially proposed by Goadsby and Lipton in 1997 and have since been revised and included in the second edition of the IHS classification of headache disorders.^{23,24} IHS diagnostic criteria are illustrated in Table 2. IHS criteria stipulate that headaches occur only during sleep and awaken the patient. Headaches should meet 2 of the following 3 criteria: (1) frequency greater than 15 times per month; (2) duration of at least 15 minutes after awakening; (3) first occur after 50 years of age. Autonomic features are to be absent and patients can have only 1 of nausea, photophobia, or phonophobia. The role of diagnostic testing in patients with hypnic headache has yet to be strictly defined. Given reports of hypnic headache secondary to a mass lesion and obstructive sleep apnea, it is reasonable to consider magnetic resonance imaging of the brain and polysomnography. Overnight polysomnography is recommended to exclude a sleep-related respiratory disturbance or movement disorder. In addition to hypnic headache, obstructive sleep apnea has also been reported to precipitate cluster headache in predisposed individuals.²⁵ Overnight polysomnography has therefore been recommended in patients with hypnic headache both to exclude a sleep-related respiratory disturbance as well as to better understand the unique and unusual relationship between sleep and headache.¹⁶

REFERENCES

1. Paiva T, Farinha A, Martins A, Batista A, Guillemainault C. Chronic headaches and sleep disorders. *Arch Intern Med.* 1997;157:1701-1705.
2. Guillemainault C, Hold J, Mitler MM. Clinical overview of the sleep apnea syndromes. In: Guillemainault C, Dement WC, eds. *Sleep Apnea Syndromes.* New York: Alan R. Liss Inc.; 1978:1-12.
3. Dexter JD. Headache as a presenting complaint of the sleep apnea syndrome. *Headache.* 1984;24:171.
4. Raskin NH. The hypnic headache syndrome. *Headache.* 1988;28:534-536.
5. Evers S, Goadsby PJ. Hypnic headache—clinical features, pathophysiology, and treatment. *Neurology.* 2003;60:905-909.
6. Dodick DW, Mosek AC, Campbell JK. The hypnic (“alarm clock”) headache syndrome. *Cephalalgia.* 1998;18:152-156.
7. Grosberg BM, Lipton RB, Solomon S, Ballaban-Gil K. Hypnic headache in childhood: A case report. *Cephalalgia.* 2004;25:68-70.
8. Centonze V, D’Amico D, Usai S, Causarano V, Bassi A, Bussone G. First Italian case of hypnic headache, with literature review and discussion of nosology. *Cephalalgia.* 2001;21:71-74.
9. Skobieranda FG, Lee TG, Soloman GD. The hypnic headache syndrome: Six additional patients [abstract]. *Cephalalgia.* 1997;17:304.
10. Gould JD, Silberstein SD. Unilateral hypnic headache: A case study. *Neurology.* 1997;49:1749-1750.
11. Vieira-Dias M, Esperanca P. Hypnic headache: Report of two cases [abstract]. *Cephalalgia.* 2000;20:312.
12. Morales-Asin F, Mauri JA, Iniguez C, Espada F, Mostacero E. The hypnic headache syndrome: Report of three new cases. *Cephalalgia.* 1998;18:157-158.
13. Trucco M, Maggioni F, Badino R, Zanchin G. Hypnic headache syndrome: Report of a new Italian case [abstract]. *Cephalalgia.* 2000;20:312.
14. Dodick DW, Jones JM, Capobianco DJ. Hypnic headache: Another indomethacin responsive headache syndrome? *Headache.* 2000;40:830-835.
15. Capo G, Esposito A. Hypnic headache: A new Italian case with a good response to pizotifen and melatonin [abstract]. *Cephalalgia.* 2001;21:505-506.
16. Dodick DW. Polysomnography in hypnic headache syndrome. *Headache.* 2000;40:748-752.
17. Peatfield RC, Mendoza ND. Posterior fossa

- meningioma presenting as hypnic headache. *Headache*. 2003;43:1007-1008.
18. Lisotto C, Maggioni F, Mainardi F, Zanchin G. Caffeine efficacy in hypnic headache syndrome [abstract]. *Cephalalgia*. 2000;20:332.
 19. Ivanez V, Soler R, Barriero P. Hypnic headache syndrome: A case with good response to indomethacin. *Cephalalgia*. 1998;18:152-156.
 20. Queiroz LP, Coral LC. The hypnic headache syndrome: A case report [abstract]. *Cephalalgia*. 1997;17:303.
 21. Newman LC, Lipton RB, Soloman S. The hypnic headache syndrome: A benign headache disorder of the elderly. *Neurology*. 1990;40:1904-1905.
 22. Sibon I, Ghorayeb I, Henry P. Successful treatment of hypnic headache syndrome with acetazolamide. *Neurology*. 2003;61:1157-1158.
 23. Goadsby PJ, Lipton RB. A review of paroxysmal hemicranias, SUNCT syndrome, and other short-lasting headaches with autonomic features, including new cases. *Brain*. 1997;120:193-209.
 24. Headache Classification Committee of the International Headache Society. The international classification of headache disorders. *Cephalalgia*. 2004;24(suppl 1):1-151.
 25. Chervin RD, Zallek MS, Nath S, et al. Sleep disordered breathing in patients with cluster headache. *Neurology*. 2000;54:2302-2306.