

A MIDDLE-AGED MAN WITH JOGGING-INDUCED HEADACHES

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Case History

A 35-year-old man came to our clinic due to a history of headaches related to physical exercise. He worked as a high-school teacher, had no significant medical antecedents, and used to jog for around 40 minutes three times a week. He described a history of headaches meeting International Headache Society (IHS) migraine without aura criteria since he was a teenager, occurring about four times every year. These headaches used to respond well to naproxen sodium. Several years earlier, he had had one migraine-like headache during an orgasm, which was not investigated.

Over the last 2 months, he developed headaches triggered by his jogging sessions. Usually, around the peak of his exercise, he begins to feel a bitemporal pounding or throbbing headache, associated with photophobia and some noise sensitivity and nausea. The headache began as a subtle temporal ache while running, but increased rapidly, and in about 10 to 15 minutes became moderate to severe and obliged him to stop exercising. Then, he noticed an immediate relief, usually with total headache disappearance if he remained still. A few times, however, pounding headaches had a duration of 12 to 24 hours, becoming duller within time before resolving. He had tried on three occasions, without success, to prevent the appearance of these exertional headaches by taking 1,100 mg of naproxen sodium just before beginning to run. He denied any focal neurologic symptoms. General and neurologic physical examinations were unremarkable.

Questions on the Case

Please read the questions, try to answer them, and reflect on your answers before reading the author's discussion.

- What is the most likely diagnosis, and what would you include in the differential diagnosis?

- Is there any relationship between his current exertional headaches with the history of migraine without aura and with his old sexual headache episode?
- Would you ask for any investigational procedure, and if so, what and why?
- What would your advice be with regard to the treatment and prevention of his current headache episodes?

Case Discussion

Diagnosis

The most likely clinical diagnosis for this patient's clinical picture should be that of benign or primary exertional headache. According to the IHS, primary exertional headache is specifically brought on by (prolonged) physical exercise, and the headache is bilateral, throbbing, and lasts between 5 minutes and 24 hours. Primary exertional headache exhibits a clear male predominance, occurring typically in young to middle-aged men. Exertional headache, however, can be secondary to a variety of conditions. Therefore, the diagnosis of primary exertional headache can be made only after a thorough examination to rule out intracranial disease (see "Investigation" below).

Exertional headache has classically been described in the medical literature together with two more provoked headaches: cough headache and sexual headache. Cough headache refers to that sudden and brief (< minutes) headache precipitated by a variety of Valsalva maneuvers, including coughing, sneezing, nose blowing, laughing, crying, lifting a weight, straining at stool, or stooping. About half the patients with cough headache, mostly old men, have a normal neuroradiologic evaluation (benign or primary cough headache), whereas in the remaining half, cough headache is symptomatic, usually due to a posterior

fossa structural lesion, almost always a Chiari type-I deformity. Taking all of this into account, it seems clear that cough headache and exertional headache are clinically separate conditions.

The classical type of acute headache associated with sexual activity is precipitated by sexual orgasm, and as with exertional headache, is bilateral, shows migraine-like characteristics, and can be idiopathic (benign type) or associated with several intracranial disorders such as an aneurysm. Exertional headache and vascular sexual headache, therefore, share many properties. Interestingly, some patients with exertional headache—and the case described in this chapter is a good example—also have a history of sexual headache, which confirms the similarity of these two provoked headaches.

Our patient described a history of rather infrequent migraine without aura attacks since adolescence. It is worth emphasizing two points in this respect. First, in clinical practice, it is important not to confound a headache induced *de novo* by exercise (ie, true exertional headache) from the exacerbation of a previous headache with any kind of exercise, as is one of the IHS criteria for the diagnosis of migraine. Second, one should bear in mind that there seems to be some relationship between migraine and exertional headache. In fact, as occurred in our case, many patients with exertional headache have either a personal or a family history of migraine, and these two conditions share a response to some medications. This does not mean that exertional headache and migraine are two clinical expressions of the same disorder, but it could be possible that migraine in some way would predispose some individuals to suffer from exertional headache.

Investigation

As stated earlier, the IHS classification requires the ruling out of any systemic or intracranial disorder to confirm the diagnosis of benign exertional headache. Even in the presence of a typical clinical picture like the one described here, the diagnosis of primary exertional headache can be made only after a thorough investigation. For typical patients (middle-aged men with normal examination), it is mandatory to exclude any kind of intracranial space-occupying lesion and sentinel hemorrhage due to vascular malformations. Very rarely, exertional headache is a symptom of middle cerebral artery dissection. Thus, classically, the minimum recommended work-up in these cases included a computed tomography brain scan and, in doubtful cases, a lumbar tap followed by a cranial angiographic study if there was any suspicion of subarachnoid hemorrhage. Nowadays, however, magnetic resonance imaging (MRI) followed by magnetic resonance angiography (MRA) should be the initial screening procedures in these patients, due to both sensitivity in excluding space-

occupying lesions and their noninvasive nature. Both techniques, together with routine blood tests, were unremarkable in the case patient of this discussion.

Management Strategies

For nonincapacitating cases or for those with a low exercise frequency, the first (and sometimes only) recommendation should be transient exercise moderation or abstinence from exercise. Leaving exercise abstinence aside, there is no high-level scientific evidence of the relative value of pharmacologic treatments in the management of exertional headache. In general, antimigraine preventive medications show some benefit. For most patients, treatment with beta-blockers at the usual antimigraine doses seems useful. There are well-documented patients with exertional headache who did not improve or could not tolerate beta-blockers. Some of these cases seem to improve on indomethacin in doses varying from 25 to 150 mg per day. For those unresponsive to these two medications, I would recommend trying calcium antagonists, such as verapamil or flunarizine, or even valproic acid. Our patient received nadolol 80 mg per day and clearly improved. His headaches became less consistent after 2 weeks and completely disappeared after 1 month. There is no consensus on the treatment duration in these cases. In our personal experience, primary exertional headache is a transient clinical picture, usually lasting less than 3 months and rarely longer than 6 months. We therefore recommend stopping the preventive treatment after 3 to 6 months to check for headache re-appearance. In this particular patient, nadolol was withdrawn after 6 months, and he had no headache recurrence for more than 1 year.

Acute therapy, immediately before physical exercise, could theoretically be a good alternative for those patients unresponsive to prophylactic treatment and for those subjects with a low exercise frequency. Our patient tried only naproxen sodium, without success. Again, there is no scientific evidence confirming the value of ergotamine-containing medications or of triptans in treatment of exertional headache.

Case Summary

- The patient was a 35-year-old man, with a history of infrequent migraine without aura headaches.
- He presented with a 2-month history of exertional headache provoked by prolonged exercise (running).
- His symptoms, together with his normal physical examination, are very typical of the benign variant of exertional headache.
- Investigations are mandatory in these patients, as in up to one-third of cases, they can disclose either intracranial mass lesions or vascular malformations.

- Ideally, the work-up should include MRI and MRA studies, as carried out in this particular case.
- The patient was treated for 6 months with nadolol, with his exertional headache disappearing in 1 month.

Overview of Exertional Headache

Historic Overview

Until the appearance of the works of Tinel in 1932 and of Symonds in 1956, exertional headache was regarded as an ominous symptom. In every patient with this complaint, an intracranial lesion of potentially serious nature, such as a brain tumor or vascular anomaly, was suspected; even when no such lesion could be identified, an uneasy uncertainty remained. Tinel described four patients with an intermittent paroxysmal headache that occurred only with physical effort. He thought that this headache was due to painful distension of the intracranial veins. Symonds reported 27 patients with what is now known as cough headache, as his patients had headache provoked only by a variety of sudden Valsalva maneuvers, although not by prolonged physical exercise. He was the first author clearly separating benign and symptomatic cough headaches, dividing his patients into two groups. The first included six subjects with posterior fossa structural disease. The second comprised 21 patients without any evidence of a space-occupying lesion. In his important paper of 1968, Rooke described 103 patients with headache precipitated by “exertion” (eg, running, bending, coughing, sneezing, heavy lifting, or straining at stool). The majority of these patients (90%) were diagnosed as having “benign exertional headache unassociated with intracranial lesions.” Coinciding with Symonds’s experience, most patients with symptomatic “exertional” headache suffered from posterior fossa structural lesions. Rooke’s work thus confirmed Symonds’s observations and clearly documented the occurrence of a benign exertional headache variant. In

contrast to Symonds’s findings, this author did not differentiate those headaches provoked by sudden Valsalva maneuvers from those headaches provoked by prolonged exertion. Rooke’s influence has remained until relatively recent years. Likewise, in 1991, Sands and colleagues, within the term “exertional” headache, revised together the 219 cases of headache precipitated by cough or physical exertion published previously. After the appearance of the IHS classification (Table 22-1), there have been several reports emphasizing the separation between cough and exertional headache.

Epidemiology and Clinical Manifestations

Rasmussen and Olesen have assessed the lifetime prevalences of headache disorders in a cross-sectional epidemiologic survey of a representative 25- to 64-year-old general population. They found a lifetime prevalence of 1% for primary exertional headache. Primary exertional headache is typical of young people (range 10 to 48 years in our series) and is more frequent in males. The majority of cases occur in patients who have a personal or family history of migraine.

Primary exertional headache occurs in both untrained people and in trained athletes. Heat, humidity, barometric changes, high altitude, caffeine, hypoglycemia, and alcohol usage have been described as contributing factors. This exertional headache may be triggered by any kind of prolonged physical exercise, at least enough exercise sufficient to double the resting pulse for over 10 seconds, but ordinarily for minutes or even hours. Headache usually occurs at the peak of the exercise and subsides as the activity ceases, even though in some occasions, headache can last up to 2 days. Exertional headache is described as aching, pounding, or throbbing, and has many migraine characteristics, with associated nausea, vomiting, and photophobia, and some sonophobia. It may be bilateral (about 60% of cases) or unilateral. The management of this condition has already been commented on above.

Selected Readings

Table 22-1. IHS Diagnostic Criteria for Primary Exertional Headache

Description:

Headache precipitated by any form of exercise. Subforms as “weightlifters” headache are recognized.

Diagnostic criteria:

- Pulsating headache fulfilling criteria B and C
- Lasts from 5 minutes to 48 hours
- Brought on by, and occurring during of after, physical exertion
- Not attributed to another disorder

Adapted from Headache Classification Subcommittee of the International Headache Society, 2004.

IHS = International Headache Society.

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Editorial Comments

Exertional headache is an important topic, especially the “benign” or primary variant. Serious causes are important

to diagnose and manage but are less common. It is important to distinguish cough, exercise, and sex headaches from each other, from migraine, and primary from secondary causes. Interestingly, each headache type has differing clinical characteristics, but the work-up of the first three must begin with an MRI/MRA to eliminate Chiari malformations, posterior fossa lesions, and aneurysms. Dr. Pascual leads us through an interesting case and the various management scenarios. These headaches can be significant problems for patients, and although no more than a nuisance for some, they produce significant morbidity in others. We hope that in the future, primary exertional headache will be better understood from the neurobiologic point of view, but until then, recognition remains the most important clinical issue.

FINAL DIAGNOSIS:

Primary exertional headache