

## Migraine's impact today

### Burden of illness, patterns of care

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#### *CME learning objectives*

- To review the epidemiologic factors of migraine in the United States
- To learn patterns of migraine
- To recognize barriers to optimal migraine management

*The American Migraine Study I and Study II were funded by Glaxo Wellcome. The American Migraine Study II is a project of the National Headache Foundation.*

This is the first of four articles on headache

This page is best viewed with a browser that supports tables.

**Preview:** Migraine is a common disorder that causes severe headaches and associated nausea, photophobia, phonophobia, and temporary disability. Though the pain and other symptoms of migraine can be effectively managed, the condition remains underdiagnosed and undertreated. In this article, Drs Lipton, Stewart, Reed, and Diamond consider the scope and distribution of the migraine problem and the current patterns of care in the United States.

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**M**ost people who have migraine experience moderate to severe pain and temporary disability from their headaches (1,2). Because many do not consult physicians, community-based studies are required to obtain a complete picture of the disorder (2-4). Epidemiologic factors of migraine have been investigated in a large number of studies in the United States and elsewhere (2,5).

Here, we present data from the 1989 American Migraine Study I (6,7) and the 1999 American Migraine Study II (8,9). In each epidemiologic study, validated questionnaires were mailed to representative samples in the United States to examine migraine prevalence according to diagnostic criteria developed by the

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These studies measured migraine prevalence by age and sex. Attack frequency and related disability were examined to assess the burden of the disease. Patterns of diagnosis were measured to identify barriers to diagnosis and, by implication, barriers to medical care. Patterns of medication use also were evaluated. On the basis of study results, we make recommendations for improving the diagnosis and treatment of migraine.

### Study samples and methods

The American Migraine Study I evaluated responses from 23,611 participants in 15,000 households (6); the American Migraine Study II examined responses from 34,009 participants in 20,000 households (8). Respondents answered detailed questions about symptoms, frequency, and duration of headaches, and headache-related disability. The respondents also reported their experiences with headache diagnosis and treatment. Using IHS criteria, investigators assigned a diagnosis of migraine regardless of whether participants had ever received a medical diagnosis. Study methods are detailed elsewhere (6-9).

### Headache prevalence by age and sex

About 18% of female and 6% of male respondents met the criteria for migraine. Overall, the prevalence of migraine was stable over the 10-year study period (figure 1: not shown). However, the prevalence varied with age, increasing from age 12 to age 40 in both males and females and then falling (figure 2: not shown). Other studies (2,5) have reported comparable findings.

The ratio of females to males with migraine varied strongly with age. Data from other studies have shown that before age 12, migraine is more common in boys than in girls (11). After puberty, it becomes increasingly more common in females. At age 20, the female-male ratio is about 2:1 (6,8). The ratio peaks between 42 and 44 years, at about 3:1 (6,8). Thereafter it decreases, but the female preponderance persists throughout adulthood. In other words, the prevalence of migraine in women increases during the years of menstruation, peaks before the average age at menopause, and then declines. The high prevalence of migraine in women cannot be attributed exclusively to cyclical hormonal factors, however, because sex differences in prevalence persist well beyond menopause. Reasons for these sex differences in migraine prevalence are not well understood.

### Pain and associated symptoms

In the American Migraine Study II, about one third of the respondents reported that their headache pain was extremely severe; another 45% described their pain as severe (8). Pain was reported as pulsatile by 85% and unilateral by 59%. Migraine-associated symptoms included photophobia (80%), phonophobia (76%), nausea (73%), and aura (36%). None of these features occurs in all patients who meet a strict definition of migraine, and no single symptom is required for diagnosis. Thus, physicians who require unilateral pain as a criterion for diagnosis will miss 41% of cases; those who require aura will miss two thirds. In other words, it is important to recognize migraine as a symptom complex with variable symptom profiles (10).

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## Frequency and disability

In the American Migraine Study II, respondents with migraine reported a broad range of attack frequencies (figure 3: not shown). Over a 3-month period, 22% experienced 10 or more days with severe headache, 19% had five to nine, and nearly half had one to four (8).

Study parameters defined disability by the extent to which headaches interfered with work or daily activities. Overall, 92% of respondents with migraine reported some disability as a result of their headaches; 53% described severe disability or the need for bed rest (figure 4: not shown) (8).

The impact of migraine on productivity (measured as time lost from activities) was determined by using questions from the Migraine Disability Assessment Scale (12,13). Over a 3-month period, 51% of respondents reported at least 1 day where productivity at work or school was reduced by 50% or more, 75% were unable to do chores or household work, and 58% missed family, social, or leisure activities.

## National projections

Sex- and age-specific prevalence data from the surveys were used to estimate the number of people who experience migraine and disabling migraine. With data from the 1989 study, 23.6 million Americans were estimated to have migraine (6). By 1999, the number had grown in accordance with the US population to 27.9 million (8).

## Patterns of diagnosis

Study participants with migraine were identified on the basis of (1) reported headache features meeting revised IHS diagnostic criteria (10) and (2) their report of a medical diagnosis of migraine.

In the 1989 study, 39% of respondents who experienced migraine reported that they had received a medical diagnosis; 61% had never been diagnosed. This can be depicted as a migraine "iceberg," with the 61% below the water line (figure 5: not shown) (7). In the 1999 study (9), 48% of those with migraine reported that they had received a medical diagnosis. In general, women (51%) were more likely to receive a diagnosis than men (41%). Nonetheless, it is probable that even today most people with migraine have never received a diagnosis.

In the American Migraine Study II, the distribution of disability among respondents with diagnosed or undiagnosed migraine is described in table 1. Not surprisingly, we found that severe disability was more common in people who had received a diagnosis, probably because disability increases the likelihood of medical consultation. Forty percent of those without a diagnosis had severe disability or required bed rest, and another 45% had some impairment (9).

**Table 1. Degree of temporary disability in people with diagnosed and undiagnosed migraine**

Productivity	Diagnosed (n = 1,750)	Not diagnosed (n = 1,878)
Normal	4.3%	11.8%

Some impairment	30.4%	45.2%
Severe impairment or bed rest	64.7%	40.3%

*Data from American Migraine Study II (8,9).*

## **Patterns of medication use**

Over 95% of people with migraine take medication for their headaches; thus, they are motivated to use medication to seek relief. However, most continue to use over-the-counter medication rather than prescription drugs (9,14). In the 1999 study (9,14), only 41% of those with migraine used prescription drugs for their headaches, an increase of only 4% from 1989 (figure 6: not shown).

Three over-the-counter drugs have been approved for migraine by the US Food and Drug Administration: one combination of aspirin, acetaminophen, and caffeine (Excedrin Migraine) and two formulations of ibuprofen (Advil Migraine, Motrin Migraine Pain). If over-the-counter drugs relieve pain and restore function, they are a useful treatment option. However, the severe pain and disability among people with migraine who have never received a diagnosis suggests that many are undertreated (9,14,15).

## **Conclusion**

Migraine is a remarkably common problem in the United States. Over 92% of people with migraine report at least some headache-related disability. At the same time, many do not consult physicians for their headaches, and less than half have received a medical diagnosis. Despite the development of a wide range of effective treatments, most people with severe migraine are not treated with prescription drugs.

Certain features emerge as barriers to diagnosis and, by implication, as barriers to medical care. Low income, youth, and male sex are all associated with a decreased probability of diagnosis (7). Severe disability, vomiting, and auras are associated with an increased probability of diagnosis. However, even among people who experience severe disability, a large proportion do not receive a diagnosis and prescription drugs (7,9). Although most people with migraine use over-the-counter drugs, current therapy appears to be unsatisfactory given the frequency and associated disability of this disorder. Over the last decade, rates of diagnosis and use of prescription drugs have increased only modestly.

Given the many effective treatment options for migraine, many migraine attacks could be prevented, aborted, or significantly ameliorated through appropriate medical care. What should be done about the large number of people with severe migraine who are undiagnosed and untreated? We recommend the following:

- Additional research should be undertaken to clarify the barriers to diagnosis and effective treatment of migraine.
- Education programs should be expanded to inform the public that migraine is a legitimate, treatable medical illness.

- Physician-education programs based on the recently developed Headache Consortium Guidelines need to be implemented to improve diagnosis and treatment (15).
- Screening in clinics and workplaces should be considered to help identify people with significant migraine-associated disability who would benefit from medical care.

## References

1. **Stewart WF, Schechter A, Lipton RB.** Migraine heterogeneity: disability, pain intensity, and attack frequency and duration. *Neurology* 1994;44(6 suppl 4):S24-39
2. **Rasmussen BK.** Epidemiology of headache. *Cephalalgia* 1995;15(1):45-68
3. **Lipton RB, Stewart WF, Simon D.** Medical consultation for migraine: results from the American Migraine Study. *Headache* 1998;38(2):87-96
4. **Stang PE, Osterhaus JT, Celentano DD.** Migraine: patterns of healthcare use. *Neurology* 1994;44(6 suppl 4):S47-55
5. **Scher AI, Stewart WF, Lipton RB.** Epidemiology of migraine: a meta-analytic review. In: Crombie IK, ed. *Epidemiology of pain: a report of the Task Force on Epidemiology of the International Association for the Study of Pain*. Seattle: IASP Press, 1999:159-70
6. **Stewart WF, Lipton RB, Celentano DD, et al.** Prevalence of migraine headache in the United States: relation to age, income, race, and other sociodemographic factors. *JAMA* 1992;267(1):64-9
7. **Lipton RB, Stewart WF, Celentano DD, et al.** Undiagnosed migraine headaches: a comparison of symptom-based and reported physician diagnosis. *Arch Intern Med* 1992;152(6):1273-8
8. **Lipton RB, Stewart WF, Diamond S, et al.** Prevalence and burden of migraine in the United States: data from the American Migraine Study II (submitted for publication)
9. **Lipton RB, Diamond S, Reed M, et al.** Migraine diagnosis and treatment: results from the American Migraine Study II (submitted for publication)
10. Classification and diagnostic criteria for headache disorders, cranial neuralgias and facial pain. *Headache Classification Committee of the International Headache Society. Cephalalgia* 1988;8 suppl 7:1-96
11. **Bille B.** Migraine in children: prevalence, clinical features, and a 30-year follow-up. In: Ferrari MD, Lataste X, eds. *Migraine and other headaches*. Carnforth, United Kingdom: Parthenon, 1989
12. **Stewart WF, Lipton RB, Whyte J, et al.** An international study to assess reliability of the Migraine Disability Assessment (MIDAS) score. *Neurology* 1999;53(5):988-94
13. **Stewart WF, Lipton RB, Simon D, et al.** Validity of an illness severity measure for headache in a population sample of migraine sufferers. *Pain* 1999;79(2-3):291-301
14. **Celentano DD, Stewart WF, Lipton RB, et al.** Medication use and disability among migraineurs: a national probability sample survey. *Headache* 1992;32(5):223-8
15. US Headache Consortium. American Academy of Neurology Headache Guidelines. Available at: [http://www.aan.com/public/practiceguidelines/headache\\_gl.htm](http://www.aan.com/public/practiceguidelines/headache_gl.htm). Accessed Nov. 21, 2000

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For a helpful guide to electronic and print resources on headache for physicians and patients, see the [Resource Guide](#) in this issue.

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