Prevalence and Burden of Migraine in the United States: Data From the American Migraine Study II

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Objective.—To describe the prevalence, sociodemographic profile, and the burden of migraine in the United States in 1999 and to compare results with the original American Migraine Study, a 1989 population-based study employing identical methods.

Methods.—A validated, self-administered questionnaire was mailed to a sample of 20 000 households in the United States. Each household member with severe headache was asked to respond to questions about symptoms, frequency, and severity of headaches and about headache-related disability. Diagnostic criteria for migraine were based on those of the International Headache Society. This report is restricted to individuals 12 years and older.

Results.—Of the 43 527 age-eligible individuals, 29 727 responded to the questionnaire for a 68.3% response rate. The prevalence of migraine was 18.2% among females and 6.5% among males. Approximately 23% of households contained at least one member suffering from migraine. Migraine prevalence was higher in whites than in blacks and was inversely related to household income. Prevalence increased from aged 12 years to about aged 40 years and declined thereafter in both sexes. Fifty-three percent of respondents reported that their severe headaches caused substantial impairment in activities or required bed rest. Approximately 31% missed at least 1 day of work or school in the previous 3 months because of migraine; 51% reported that work or school productivity was reduced by at least 50%.

Conclusions.—Two methodologically identical national surveys in the United States conducted 10 years apart show that the prevalence and distribution of migraine have remained stable over the last decade. Migraine-associated disability remains substantial and pervasive. The number of migraineurs has increased from 23.6 million in 1989 to 27.9 million in 1999 commensurate with the growth of the population. Migraine is an important target for public health interventions because it is highly prevalent and disabling.

Key words: migraine, headache, prevalence, epidemiology, American Migraine Study

Abbreviation: MIDAS Migraine Disability Assessment questionnaire

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Migraine is a common and often debilitating neurologic disorder. Epidemiologic survey data describing the prevalence and distribution of migraine can be used to assess the burden of disease and the quality of medical care. In 1989, the American Migraine Study[1] was the first study in the United States to provide a population-based estimate of migraine prevalence using a case definition based on the International Headache Society (IHS) criteria.[2] This study revealed that approximately 18% of women and 6% of men suffered from migraine, for an estimated 23.6 million Americans with migraine. Migraine prevalence varied with age (highest in 35- to 45-year-olds); household income (highest in the lowest income

group, which earned less than $10000 annually); and race (higher in whites than in blacks), findings consistent with those of other studies conducted in the United States and other countries.[3-8] The American Migraine Study also revealed that migraine was underdiagnosed and undertreated, and associated with substantial disability.[9-11]

Over the past decade, many new treatments for migraine have become available, and the awareness of migraine has improved.[12] Some studies suggest that the prevalence of migraine may be increasing for reasons that have not been elucidated.[13-16] In addition, over the last decade, many initiatives to educate physicians and patients about migraine have been launched. Given these developments, we reevaluated the epidemiology, the burden, and the patterns of healthcare utilization for migraine 10 years after the American Migraine Study. In this report, we describe the epidemiology of migraine in the United States circa 1999 to determine if its prevalence, sociodemographics, or burden have changed over the last decade.

METHODS

To facilitate comparison of results over a 10-year interval,[1] this study was designed to replicate the methods of the American Migraine Study. In 1999, a self-administered headache questionnaire was mailed to a stratified random sample of 20000 US households from a defined panel (see below). Screening questions were completed by the head of the household, who reported the total number of household members and the number of household members suffering from self-defined severe headache. Each household member with severe headache was asked to complete the headache questionnaire, which contained questions on symptoms, frequency, and severity of headaches and on headache-related disability. Questions on patterns of medical diagnosis and treatment were also included and are the subject of separate reports.

Sample.—The 20000 households were drawn from a 600000-household nationwide panel maintained by National Family Opinion, Inc (NFO). Each household in the panel is assigned to 1 of 120 blocks. Each block contains 5000 households and is constructed to be representative of the US population in regional population density, age of the head of the household, household income, and number of household members. Demographic and census information is obtained from each household during an initial recruitment mailing and updated every 2 years. Thirty percent of each sampling block is replaced every 2 years. Upper-income white households are overrepresented in the NFO sampling frame; very high- and very low-income households are underrepresented.

Survey.—The self-administered questionnaire included eight questions on headache features, including unilateral head pain, pulsating/throbbing pain, nausea, vomiting, sensitivity to light, sensitivity to sound, visual scotoma (shimmering lights, circles, or other shapes, or colors prior to a headache), and numbness of the lips, tongue, fingers, or legs before the onset of headache. In addition, the survey included questions about disability from severe headaches (bed rest required, working ability or activity substantially impaired, working ability or activity impaired to some degree) and frequency of severe headaches (daily, 2 to 6 per week, 1 per week, 1 to 3 per month, or 1 to 12 times per year). The 1999 survey also included a new set of questions from the Migraine Disability Assessment (MIDAS) questionnaire.[17-19] The MIDAS assesses the impact of severe headaches on work, household work, and family, social, and leisure activities.

Migraine Case Definition.—A diagnosis of migraine was assigned based on the 1988 IHS criteria for migraine with and without aura.[2] Migraine was identified if a respondent reported at least one severe headache in the previous 12 months with unilateral or pulsatile pain, and either nausea, vomiting, or phonophobia with photophobia; or visual or sensory aura before the headache. If these criteria were not met, the respondents with severe headache were classified as suffering from "other severe headache." Subjects with daily severe headache were not categorized as suffering from migraine, as migraine is an episodic disorder.

The survey was validated in a population sample of migraineurs (n = 112) and controls with other types of headache, mostly tension-type headache (n=62) (R.B.L., data on file). The validation sample was iden-

tified by a telephone interview survey and then assessed in person for definitive diagnosis by a physician with expertise in headache. The sensitivity (defined as the proportion of migraineurs whose survey results were positive for migraine) of the survey for this sample was 100%; the specificity (defined as the proportion of individuals who did not have migraine and whose survey results were negative for migraine) was 82.3%.

Data Analysis.—Data from subjects 12 years and older were analyzed as previously described.[1] Sex-specific prevalence estimates of migraine (1-year period prevalence) were derived by age, race, urban versus rural residence, household income, and region of the country. GLIM Poisson regression (log-linear models)[20] was used to model sex- and age-specific prevalence by income and to derive adjusted prevalence ratios. Preliminary analysis showed that males and females differed substantially both in the absolute prevalence of migraine and by covariates. Therefore, data were modeled separately by sex. Age was divided into five categories, beginning with aged 20 to 24 years and continuing to aged 75 to 79 years. Those aged 12 to 19 years and those 80 years or older were treated as separate categories, and all age groups were modeled as a continuous variable. Four race groups (blacks, whites, others, and unknown), four population density groups (less than 100000, 100000 to 499999, 500000 to 1999999, greater than or equal to 2000000), five income groups (less than $15000, $15000 to $29999, $30000 to $49999, $50000 to $74999, greater than or equal to $75000), and nine US regions (Mountain, New England, Middle Atlantic, South Atlantic, East North Central, West North Central, East South Central, West South Central, Pacific) were defined.

Analysis of variance (ANOVA) was used to determine whether a single variable significantly improved the fit of the log-linear model to the data. The degrees of freedom for each test equaled the number of categories for that variable minus 1. Crude and adjusted prevalence ratios were derived as the ratio of migraine prevalence in one category of a variable versus a reference category.

RESULTS

Response Rate.—Of the 20000 households surveyed, 13869 households responded to the questionnaire for a 69.3% household return rate. Completed questionnaires were obtained from 29727 (68.3%) of the 43527 individuals 12 years and older residing in the sample of 20000 households. Of these individuals, 6211 experienced severe headaches (4271 females and 1940 males). Response rates did not differ by sex, region, regional population density, or household income, but were inversely related to household size, higher in whites than in blacks, and higher in older age groups (Table 1).

Migraine Prevalence and Sociodemographic Characteristics.—*Crude Prevalence Estimates.*—The number of females meeting the IHS case definition of migraine was 2818; the number of males was 920. The crude prevalence of migraine was 18.2% among females and 6.5% among males (Figure 1). Approximately 23% of respondent households had at least one member with migraine (Figure 2). Migraine prevalence was higher in whites than in blacks and was nonlinearly related to age in both males and females (Table 2). Prevalence was highest in middle life, ie, in the age categories 30 to 39 years and 40 to 49 years. In addition, there was an inverse relationship to household income (Table 2).

Adjusted Estimates.—Sex-specific regression models were used to adjust for possible confounding of demographic variables in estimating prevalence. Among males, age ($F = 99.8$, $df = 1$, $P < .001$), age squared ($F = 60.6$, $df = 4$, $P < .001$), age cubed ($F = 76.6$, $df = 3$, $P < .001$), income ($F = 87.5$, $df = 2$, $P < .001$), and race ($F = 50.2$, $df = 5$, $P < .001$) significantly improved the fit of the model to the data. Among females, age ($F = 373.0$, $df = 2$, $P < .001$), age squared ($F = 236.7$, $df = 4$, $P < .001$), age cubed ($F = 371.8$, $df = 1$, $P < .001$), income ($F = 289.6$, $df = 3$, $P < .001$), race ($F = 194.2$, $df = 5$, $P < .001$) and population density ($F = 164.1$, $df = 6$, $P < .001$) each significantly improved the fit of the model to the data. Population density was not significant among males. Urban versus rural residence, census region, and interaction terms did not significantly improve model fit. All covariates were included in the final model to derive adjusted prevalence ratios by race, income, urban versus rural residence, and region. Figure 3 depicts age-specific, adjusted prevalence for males and females. Prevalence increased from aged 12 years to about aged 40

Table 1.—Distribution of Total Population and Respondents-1999

	No. in Total Population Surveyed	Distribution in Total Population Surveyed, % Respondents	No. of Respondents	Response Rate, %
Sex				
Male	21118	48.5	14260	67.5
Female	22409	51.5	15467	69.0
Race				
White	38123	87.6	26517	69.6
Black	2870	6.6	1698	59.2
Other	1665	3.8	939	56.4
Unknown	869	2.0	573	65.9
Age, y				
12-17	4552	10.5	3002	65.9
18-29	6997	16.1	4195	60.0
30-39	8091	18.6	5062	62.6
40-49	8282	19.0	5754	69.5
50-59	6326	14.5	4547	71.9
⩾60	9279	21.3	7167	77.2
Region				
Mountain	2742	6.3	1881	68.6
New England	2189	5.0	1523	69.6
Middle Atlantic	6174	14.2	4341	70.3
South Atlantic	7904	18.2	5411	68.5
East North Central	7227	16.6	5041	69.8
West North Central	3085	7.1	2159	70.0
East South Central	2768	6.4	1889	68.2
West South Central	4878	11.2	3223	66.1
Pacific	6560	15.1	4259	64.9
Population density				
<100000	9100	20.9	6258	68.8
100000-499999	6644	15.3	4539	68.3
500000-1999999	8679	19.9	5882	67.8
⩾2000000+	19104	43.9	13048	68.3
Household size, No.				
1	5179	11.9	3933	75.9
2	12691	29.2	9672	76.2
3	8394	19.3	5526	65.8
4	9117	20.9	5774	63.3
⩾5	8146	18.7	4822	59.2
Household income				
<$15000	6020	13.8	4328	71.9
$15000-$29999	7442	19.4	5779	68.5
$30000-$49999	10008	23.0	6669	66.6
$50000-$74999	9129	21.0	6200	67.9
⩾$75000	9928	22.8	6751	68.0
Total	43527	100.0	29727	68.3

years and declined thereafter. Prevalence was much higher in females than in males across the life span in the ages examined in this study. Prevalence ratios adjusted for these covariates reflected a higher prevalence of migraine in whites than blacks and in lower-income groups than higher-income groups for both male and female migraineurs (Table 2). Migraine prevalence did not systematically vary by region of the country (Table 2).

Migraine Frequency and Headache Days.—The frequency of severe headache was similar for female and male migraineurs (Table 3). Overall, 62% of respondents experienced one or more severe headaches per month. The proportion of migraineurs reporting one

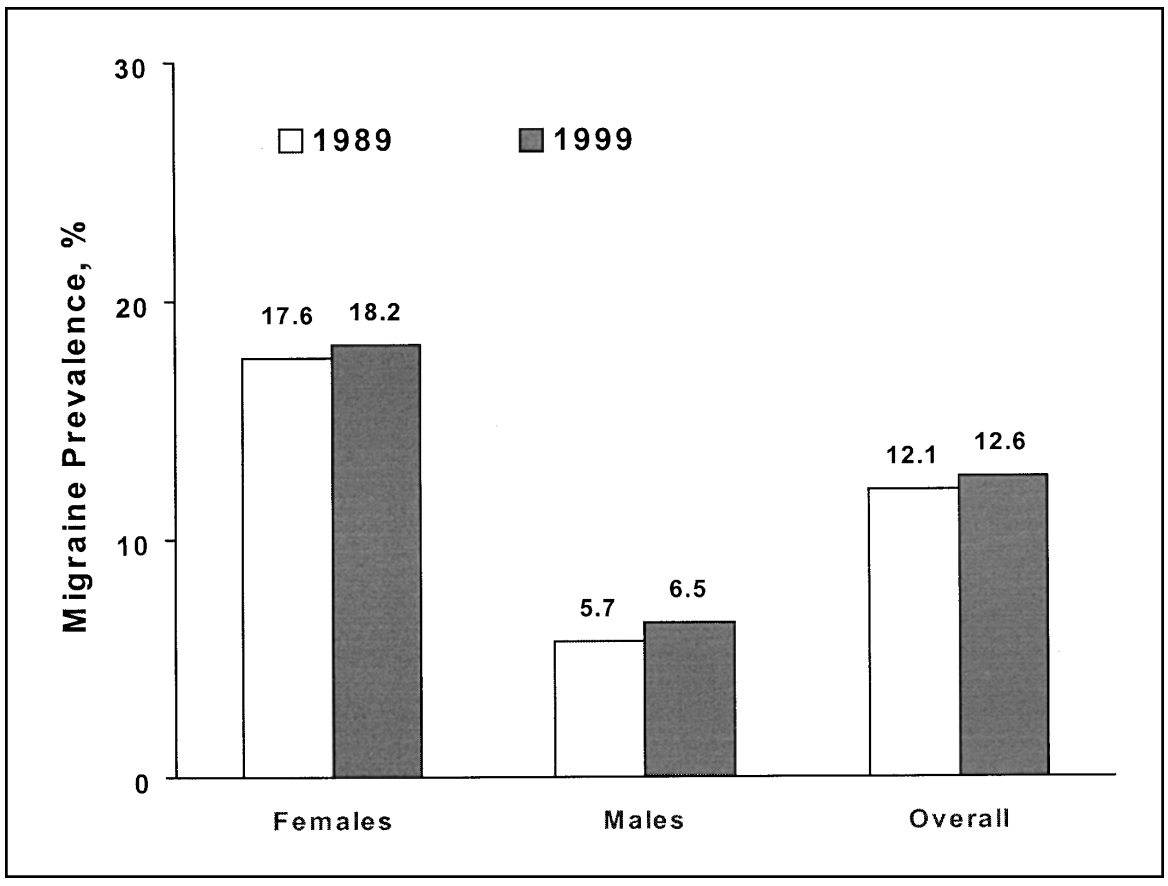

Fig 1.—One-year period prevalence of migraine from 1989[1] and the 1999 American Migraine Study II.

to three severe headaches per month was 36.8%; 10.8% of respondents reported a severe headache once per week (Table 3). The mean number of days in the 3 months prior to the survey with a headache was higher in female migraineurs (7.6) than in male migraineurs (7.0).

Migraine Symptoms.—The most frequently reported migraine symptoms were pulsatile pain (85% of migraineurs), light sensitivity (80% of migraineurs), and sound sensitivity (76% of migraineurs) (Table 3). Nausea (73%), unilateral pain (59%), blurred vision (44%), aura (36%), and vomiting (29%) were re-

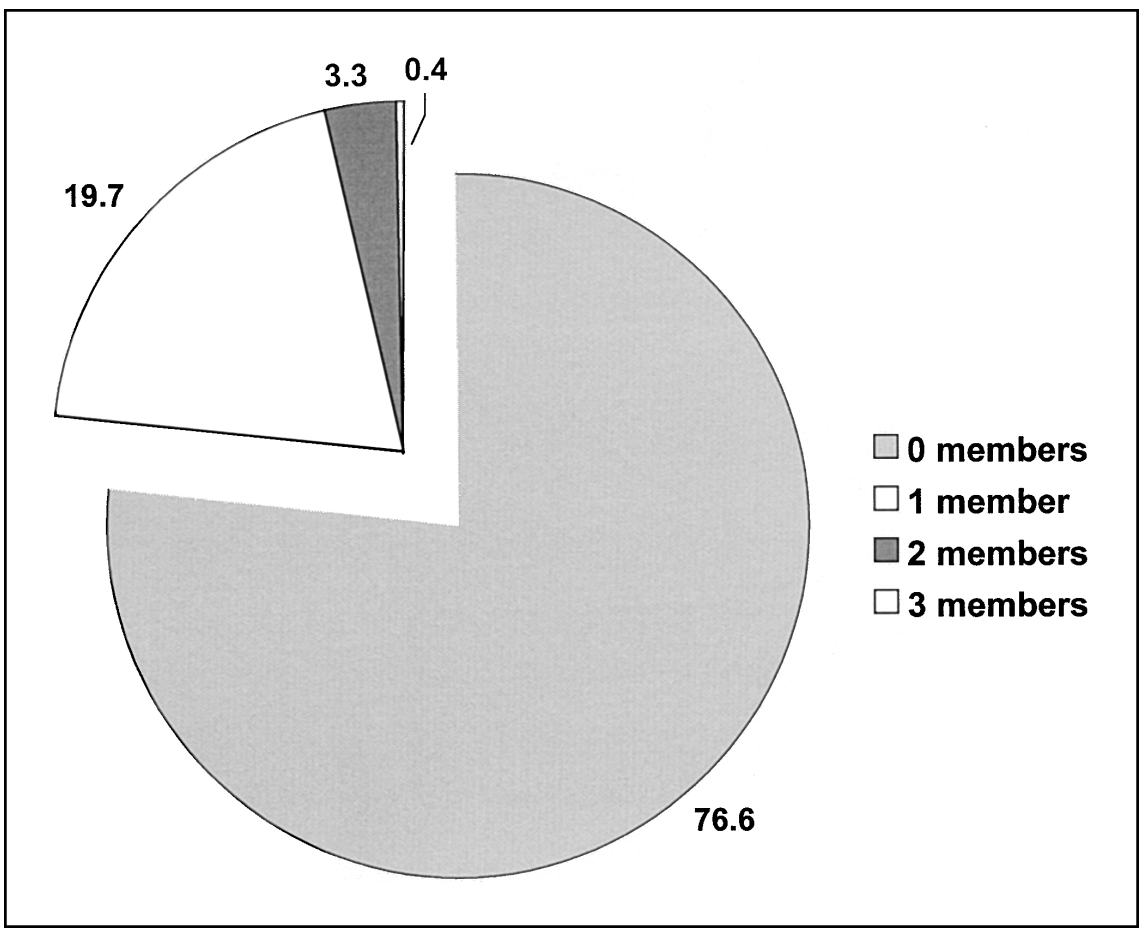

Fig 2.—Percentages of households with zero, one, two, or three family members with migraine-1999.

Table 2.—Sex-Specific Migraine Prevalence and Prevalence Ratios-1999

	Prevalence		Crude and Age-Adjusted Prevalence Ratios*			
	Male	Female	Male		Female	
	Crude	Crude	Crude	Adjusted	Crude	Adjusted
Race						
White†	6.5	18.3	1.00	1.00	1.00	1.00
Black	4.6	15.0	0.70	0.70‡	0.82	0.82‡
Age, y						
12-17†	5.2	7.1	1.00	1.00	1.00	1.00
18-29	7.2	21.5	1.37	1.57‡	3.02	2.37‡
30-39	9.7	27.3	1.86	2.02‡	3.84	3.41‡
40-49	8.1	26.0	1.54	1.74‡	3.66	3.11‡
50-59	7.0	19.7	1.35	1.24‡	2.77	2.26‡
⩾60	2.5	7.5	0.47	0.58‡	1.05	0.92‡
Region						
Mountain†	6.4	18.3	1.00	1.00	1.00	1.00
New England	5.2	16.1	0.81	0.98	0.88	0.93‡
Middle Atlantic	6.2	16.6	0.98	0.97	0.91	0.94‡
South Atlantic	6.3	18.5	0.99	0.94‡	1.01	0.95‡
East North Central	6.2	16.9	0.97	0.98‡	0.93	0.96‡
West North Central	6.5	19.3	1.03	0.98	1.06	0.98
East South Central	9.2	21.0	1.45	1.00	1.15	0.97
West South Central	6.2	21.3	0.98	1.00	1.17	0.98
Pacific	6.7	17.6	1.06	0.95‡	0.96	0.97‡
Regional population density						
<100000†	6.6	20.4	1.00	1.00	1.00	1.00
100000-499999	7.0	19.9	1.07	0.97‡	0.98	0.99
500000-1999999	6.4	18.0	0.97	0.92‡	0.88	0.97‡
⩾2000000	6.2	16.6	0.94	0.87‡	0.81	0.94‡
Household income						
<$15000†	10.2	20.2	1.00	1.00	1.00	1.00
$15000-$29999	7.0	17.7	0.68	0.85‡	0.87	1.00
$30000-$49999	6.7	19.3	0.65	0.79‡	0.95	1.00
$50000-$74999	5.5	18.9	0.54	0.67‡	0.93	0.92‡
⩾$75000	5.1	15.3	0.50	0.51‡	0.76	0.81‡

*Adjusted for age, race, household income, population density, and region of the United States.
†Reference category.
‡$P<.05$.

ported with significant prevalence (Table 3). Compared with males, females were more likely to report light sensitivity, sound sensitivity, and nausea.

Migraine-Associated Disability.—Ninety-one percent of migraineurs reported functional impairment with their headaches. Fifty-three percent reported that their severe headaches caused severe impairment in activities or required bed rest; the proportion of respondents reporting severe disability was similar between females and males (Table 3). The duration of migraine-associated activity restriction was greater among female migraineurs, 30.5% of whom (compared with 22.9% of males) experienced 1 to 2 days of activity restriction during a migraine (Table 3).

Approximately 31% of all migraineurs missed at least 1 day of work or school in the 3 months prior to the survey because of migraine; 51% reported that work or school productivity was reduced by at least

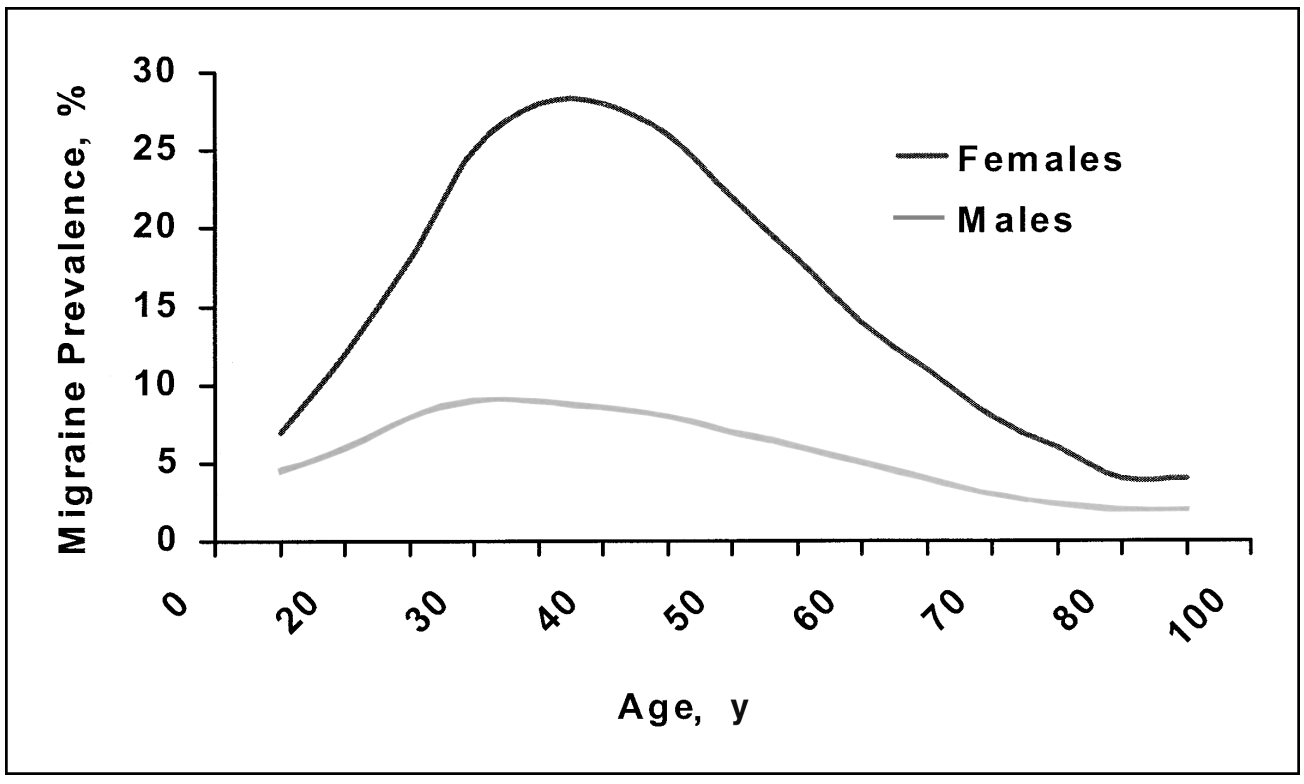

Fig 3.—Adjusted age-specific prevalence of migraine by sex-1999.

50% (Table 3). Household and family or social activities were more likely than work or school activities to be disrupted by migraine: 76% of respondents reported not doing any household work on at least 1 day in the previous 3 months because of headache; 67% reported that household work productivity was reduced by at least 50%. With the exception of household work, which was more frequently disrupted in females compared with males, the pattern of results was similar between females and males (Table 3).

COMMENTS

The 1-year prevalence of migraine was 18.2% among females and 6.5% among males in this population-based sample. These estimates are very similar to the results of the methodologically identical American Migraine Study[1] conducted in 1989, when migraine prevalence was 17.6% in females and 5.7% in males. Similar results were also observed in other US population-based surveys conducted in Baltimore County, Maryland in 1993[21] (n=12328; prevalence of 19% in females and 8% in males) and in Philadelphia County, Pennsylvania in 1998 (R.B. Lipton, MD, unpublished data, 1998) (n=4376; prevalence of 17% in females and 6% in males). Considered together, the data show that the prevalence of migraine has been stable in the United States over the last decade in studies using standardized diagnostic criteria.

Historically, estimates of migraine prevalence have varied, in large part because of differences in study methods, migraine case definitions, and the demographic characteristics of the study population. A meta-analysis of 24 studies[22] showed that about 70% of the variance in migraine prevalence estimates was explained by differences in case definition and sociodemographic profiles (age and gender) among study populations. A more recent meta-analysis[5] that included only studies using IHS-based migraine definitions and stratifying by gender showed that much of the remaining variation among studies was accounted for by differences among studies in the age distribution of study populations and geographic region of study (see below). The methodologic similarity, uniform case definition, demographic comprehensiveness, and national scope of the two American Migraine Studies hold these factors constant.

The American Migraine Study II results do not support the suggestion that migraine prevalence or incidence may be increasing over time. An analysis of the National Health Interview Survey data reported a 60% increase in migraine prevalence from 1980 to 1989 in the United States.[15] In this study, migraine was defined by answers to the question, “During the past 12 months, did anyone in the family have a migraine headache?” These self-reports were not validated by application of IHS diagnostic criteria based

Table 3.—Migraine Frequency and Disability Data-1999*

Variable	Male	Female	Total
Frequency of severe headache			
2-6 per week	14.9	14.2	14.4
1 per week	12.6	10.3	10.8
1-3 per month	35	37.3	36.8
1-12 per year	37.5	38.2	38
Migraine symptoms			
Pulsatile pain	85	85	85
Light sensitivity	74	82	80
Sound sensitivity	70	77	76
Nausea	65	75	73
Unilateral pain	53	61	59
Blurred vision	42	44	44
Aura	31	37	36
Vomiting	26	30	29
Neurologic signs	11	11	11
Days in previous 3 months with headache			
0	12	9	10
1-4	51	47	48
5-9	16	21	20
10-19	11	13	13
20-29	5	4	4
⩾30	5	6	6
Disability during severe headaches			
Function normally	11	8	9
Some impairment	40	39	39
Severe impairment or bed rest required	49	53	53
Days of activity restriction per headache			
0	22	18.1	19
<1	53	47.3	48.7
1-2	22.9	30.5	28.7
3-5	1.6	3.2	2.8
⩾6	0.5	0.9	0.8
School/work/social impact in previous 3 months			
Missed at least 1 day of work/school	31.9	30.5	30.9
Work/school productivity reduced by at least 50%	51.1	50.9	51
Did no household work	62.5	79	75.5
Household productivity reduced by at least 50%	54	70.1	66.6
Missed family or social activity	58.6	58.9	58.8

*Values are percentage of respondents.

on reported symptoms. To be classified as a migraine case, subjects had to be aware of their migraine diagnosis. Using this case definition, it is not possible to distinguish a change in prevalence from a change in disease awareness. An increase in migraine awareness is plausible given the substantial physician- and lay-directed migraine educational efforts over the last two decades and the demonstration that migraine consultation and diagnosis rates have increased over the last decade.[23]

Reports from two studies[13,14] conducted in Olmsted County, Minnesota suggest that migraine incidence increased substantially from 1979 to 1990. Migraine cases in these studies were identified via reviews of medical records of patients who had consulted physicians for headache. The authors acknowledge the possibilities that increasing consultation rates or improved medical record keeping could account for the apparent increase in incidence. The decrease in average time from headache onset to first

consultation and the previously referenced trends in migraine consultation and diagnosis support the hypothesis that these trends reflect changes in medical care and not in disease prevalence.

Like overall migraine prevalence in the United States, the distribution of disease by sociodemographic factors has also generally remained stable over the last decade. Migraine was about three times more common in females than in males in both American Migraine Study surveys and in other studies employing a variety of methodologies.[5,7,22] The age prevalence profiles were also similar. Hormonal fluctuations across the life span may explain some of the sex differences in migraine prevalence.[24,25] The female preponderance, still present in elderly individuals, cannot be explained by circulating hormones alone.

The present report generally confirms prior results regarding migraine prevalence and race (at least regarding whites and blacks). Migraine was more prevalent in whites than other racial groups in the American Migraine Study II, a finding replicating that of the American Migraine Study.[1] Because the sampling frame is weighted toward upper-income white households, the racial group data from the American Migraine Study surveys may not be representative of blacks in the United States. However, the findings by race have been observed in other US studies[11,26] and support the observations of the current study. A meta-analysis showed that the prevalence of migraine is highest in studies from the United States and Western Europe and lower in studies from Africa and Asia, a finding that is also generally compatible with racial patterns reported herein.[5] Stewart and colleagues[21] speculated that the higher prevalence of migraine in whites may be explained in part by genetic differences in migraine vulnerability rather than cultural or environmental influences, though these influences have not been adequately elucidated.

As observed in the American Migraine Study,[1] migraine was more prevalent in lower-income groups compared with higher-income groups. Similar results have been obtained in other US studies using either income or education as the measure of socioeconomic status.[27,28] Inverse relationships between disease prevalence and socioeconomic status may be accounted for by social causation or social selection.[29] In general, this inverse relationship between migraine and socioeconomic status has not been confirmed in studies outside the United States.[30,31]

The evidence suggests that severe migraine episodes are associated with marked disability. More than half (53%) of migraineurs reported severe impairment in activity or the requirement for bed rest with severe headaches. Work or school productivity was reduced by at least 50% among half (51%) of migraineurs. These data, which demonstrate a considerable impact of migraine on functional ability, are consistent with the results of other population-based studies[32,33] as well as clinical trials[34-37] showing that migraine impairs workplace productivity and limits the ability to perform activities outside of work.

The economic and public health implications of these disability data are staggering in the context of the 13% prevalence of migraine in the United States and the fact that nearly one in four US households has a migraineur. Furthermore, the peak prevalence of migraine in both females and males occurs from aged 25 to 55 years, during the most productive years of the life span. Extrapolations from the American Migraine Study II data and 1999 sex- and age-specific census estimates of the US population indicate that 27.9 million Americans (20.9 million females and 6.9 million males) suffer from severe migraine headaches. This figure, an increase from the 23.6 million Americans estimated in the 1989 American Migraine Study,[1] is commensurate with the increase in the US population over the last decade. An estimated 14.8 million Americans suffer headaches severe enough to cause severe impairment in normal daily activities or to require bed rest.

Certain factors may lead to underestimation or overestimation of the prevalence of migraine in this study. Respondents had to report severe headaches to be eligible for classification in the migraine group. Some individuals who denied severe headache may have had migraine. Furthermore, respondents with daily severe headache were excluded because migraine is by IHS definition an episodic disorder. A recognized daily variant of migraine, transformed migraine, was excluded from the prevalence and disabil-

ity estimates in this study.[38] Also, some individuals suffering migrainous headaches (which fulfill all but one of the IHS criteria) were likely to have been excluded from these estimates.

A stringent case definition of migraine similar to that of the IHS[2] was employed in this study. The present criteria differed from strict IHS criteria in that this study did not consider the number of previous attacks experienced over the lifetime (five attacks per IHS criteria) or headache duration (4 to 72 hours untreated per IHS criteria). Moreover, migrainelike headaches arising from organic disease could not be excluded in this study. The questionnaire had a specificity of 82% using a clinical diagnosis as the reference standard, a finding that suggests that some individuals who did not have migraine may have been included in the migraine group. The net influence of these factors is likely to be small; the results of the current study are similar to those of other studies using more specific methods of diagnosis.[7,22] As the questionnaires and diagnostic criteria were identical in 1989 and 1999, comparisons between the 1989 and 1999 studies are unlikely to have been influenced by methodologic factors.

Approximately 31% of households in the American Migraine Study II failed to respond to the migraine questionnaire. Responding households may have been more likely to contain migraineurs than nonresponding households and could result in an overestimation of migraine prevalence. The finding in both American Migraine Studies that women and young people (who are most likely to suffer from migraine) were represented similarly in the group of respondents compared with the group of nonrespondents suggests that differential participation based on migraine status is unlikely to be significant factor influencing these results.

During the decade since the first American Migraine Study was conducted in 1989, migraine pharmacotherapy has dramatically improved with the advent of the triptans and the approval of new preventative therapies.[39] The data from the American Migraine Study II suggest that despite a decade of progress, the burden of migraine in the United States remains substantial. As migraine remains prevalent, disabling, underdiagnosed, and undertreated in the United States,[21] public health initiatives to improve treatment are needed.

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