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## Epidemiology of migraine

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**Abstract** The 1988 International Headache Society (IHS) classification has greatly contributed to overcoming the obstacles that had made it difficult in the past to compare results of surveys on headache epidemiology. For migraine without aura, the more recent studies of the general adult population indicate lifetime prevalence rates between 6% and 10% for men and between 15% and 26% for women. One-year prevalence rates are between 2% and 15% for men and between 4% and 35% for women. Rates of frequent migraine are 6% in men and 14% in women. Migraine occurs in 3%–6% of prepubertal children with

no significant differences between girls and boys. The prevalence of migraine without aura increases progressively from the age of 12 years up to about the age of 40, when it begins to record a gradual, progressive decrease down to 1%–4% in the elderly. For migraine with aura, recent epidemiological investigations by Rasmussen and Olesen indicate a lifetime prevalence rate of 6% and a one-year prevalence rate of 4%.

**Key words** Migraine • Migraine without aura • Migraine with aura • Epidemiology

Over the last decade, epidemiological investigations have greatly contributed not only to define the actual extent of migraine occurrence, but also to determine its actual impact on work and social life. Migraine prevalence studies have always been limited by objective methodological constraints. Therefore, analysis and interpretation of the large amount of data reported in the literature on this subject is not possible without a careful consideration and a critical evaluation of the different procedural approaches adopted so far.

The first issue to be considered is the definition of migraine. As migraine is a clinical entity whose diagnosis is not based on laboratory or other tests, but only on the evaluation of a patient's history, its epidemiology can only be investigated using accurate, unquestionable, sufficient and reliable diagnostic clinical criteria.

Certainly, the diagnostic tools commonly used prior to the introduction of the IHS classification [1] did not meet any such criteria. Indeed, the criteria set by Vahlquist [2], in

use before 1962, were not comprehensive enough, while those set by the Ad Hoc Committee [3], in use between 1962 and 1988, provided only a vague, generic description of migraine rather than a detailed list of clinical features to be considered for diagnosis. By contrast, the 1988 IHS classification [1] does include at least some of the criteria that are required for a correct prevalence study of migraine.

A second issue is the peculiar pattern of migraine attacks, which requires that the presence or absence of attacks be investigated within a precise interval of time. Therefore, the occurrence of migraine may be researched at any time of a patient's life (lifetime prevalence), or in the last year, in the last week, or even in the last 24 hours. In a few studies, not always consistent with the approved procedural guidelines, but nonetheless of some clinical significance, investigators researched cases with a "frequent" occurrence of migraine, i.e. patients to whom migraine does pose a problem.

Another important aspect in the methodological discussion is the prevalence study population. Surveys conducted in groups that are representative of the general population are certainly more reliable than surveys conducted in select groups of subjects.

Finally, the major procedural issue is the methods to be followed and the tools to be used for a correct execution of an epidemiological survey. Ideally, a headache specialist should personally interview all subjects in the study population. Obviously this approach is hardly feasible in practice. Instead, door-to-door personal interviews could be taken by trained non-medical operators; alternatively, a screening could be done of subjects who are likely to suffer from migraine, using phone calls or mailing, followed by personal interviews with all suspected migraineurs. In any event, the interviewer uses a specially designed, validated questionnaire, which is currently structured according to the diagnostic criteria of the IHS classification [1].

Prevalence data for migraine without aura from procedurally correct studies suggest a lifetime prevalence rate between 6% and 10% for men and between 15% and 26% for women (Table 1) [4–7]. One-year prevalence rates are between 2% and 15% for men and between 4% and 35% for women [5, 8–12], and rates of frequent migraine are 6% for men and 14% for women (Table 1) [13].

For migraine with aura, last-year prevalence rates varied between 0.5% and 8.0% in studies conducted prior to the IHS classification [14–16] and between 3% and 11% in later studies [5, 17, 18] (Table 2). Rasmussen and Olesen, in particular, reported a lifetime prevalence rate of 6% and a one-year prevalence rate of 4% for migraine with aura [19]. More

recent studies should be credited with a higher degree of reliability because they tend to conform to more accurate methodological criteria. It is also true, however, that in the specific case of migraine with aura, older sets of data are more likely to be close to reality, because the IHS diagnostic criteria for migraine with aura are such as to easily lead to a prevalence overestimate, if they are strictly applied to population studies.

Most epidemiological studies show that migraine prevalence not only varies with gender but also with age. Before puberty, migraine occurs in about 3%–5% of children, with no significant differences between males and females. The differences in prevalence between the two sexes begin to appear at puberty. A U.S. epidemiological survey demonstrated that migraine prevalence increases progressively in both sexes from the age of 12 years up to about the age of 40, when it begins to record a gradual, progressive decrease [11]. This evolution accounts for the very low prevalence rates (1%–4%) of migraine in the elderly.

**Table 2** The one-year prevalence of migraine with aura in the general population

One-year prevalence	Pre-IHS %	IHS criteria %
Men	0–2	3–10
Women	0–8	5–11
References	[14–16]	[17–19]

*IHS*, International Headache Society

**Table 1** The prevalence of migraine without aura in the general population

Study	Year	Country	Men, %	Women, %	Total, %
<b>Lifetime prevalence</b>					
Crisp et al. [4]	1977	Great Britain	10	26	NG
Rasmussen et al. [5]	1991	Denmark	8	25	NG
Henry et al. [6]	1992	France	6	18	NG
Göobel et al. [7]	1994	Germany	7	15	NG
<b>One-year prevalence</b>					
Waters et al. [8]	1975	Great Britain	15	23	NG
Nikiforow [9]	1981	Finland	11	35	NG
D'Alessandro et al. [10]	1988	San Marino	9	18	NG
Rasmussen et al. [5]	1991	Denmark	6	15	10
Stewart et al. [11]	1992	USA	6	18	NG
Tekle-Haimanot et al. [12]	1995	Ethiopia	2	4	NG
<b>Frequent migraine prevalence</b>					
Manzoni et al. [13]	1981	Italy	6	14	11

NG, not given

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