Prevalence of headache in an elderly population: attack frequency, disability, and use of medication

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Abstract

Objectives—To assess the 1 year prevalence of tension-type headache (TTH), migraine headache (MH), and chronic daily headache (CDH), as well as of headache in general in a rural elderly population.

Methods—A door to door two phase survey was carried out on all elderly (≥ 65 years) residents in three villages in central Italy. Participants completed a standardised headache questionnaire and underwent a clinical evaluation by a neurologist. Headache diagnosis was made according to the classification of the International Headache Society, with minor modifications for the classification of patients with MH with ≥ 15 attacks/month.

Results—Eight hundred and thirty three (72.6%) of the 1147 eligible persons completed the study protocol. One year prevalence rates were respectively 44.5% for TTH, 11.0% for MH, 2.2% for symptomatic headaches, and 0.7% for the remaining types of headache. The prevalence of headache in general was 51.0% because 62 residents had both TTH and MH attacks. Prevalence rates of patients with headache were higher in women than men (62.1% and 36.6% respectively) and decreased steadily with age for the 65–74, 75–84, and 85–96 age groups (56.7%, 45.2% and 26.1% respectively). Prevalence rates were 20.4% for patients with moderate to severe attacks, 18.0% for those with ≥ 1 attacks a month, and 4.4% for those with CDH. Of the 425 with headache 52 (12.2%) had not taken any drugs for their attacks in the previous year, 195 (45.9%) had taken them regularly, and 178 (41.9%) had taken them only when the headache pain interfered with activities that could not be postponed. Medication overuse was reported by 37.8% of patients with CDH with higher proportions for transformed migraine than for patients with chronic TTH (69.2% and 23.8% respectively, $p=0.009$).

Conclusions—A consistent proportion of elderly people have primary headaches and consultation with a specialist is particularly recommended for patients with moderate or severe attacks, or with CDH.

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Keywords: headache prevalence; elderly people

Although headache is one of the most frequent complaints in elderly people,¹ prevalence data in this increasing segment of the population are sparse because several population based stud-

ies did not include people aged 65 or over,^{2–4} or the number of elderly people was not sufficiently large to obtain reliable estimates.^{5–7} Also, some studies^{8–9} did not use the headache classification of the International Headache Society (IHS)¹⁰ or focused on either migraine headache (MH)^{11–15} or tension-type headache (TTH),^{16–17} as opposed to headache in general. Therefore, further population studies would help to understand the impact of headache in elderly people.

In 1993, we conducted a population survey on people aged 65 or over living in three rural villages in central Italy.¹⁸ As part of the survey, participants underwent a standardised questionnaire designed to comply with the IHS diagnostic criteria.¹⁰ The present study reports on the 1 year prevalence rates of MH, TTH, chronic daily headache (CDH), and of headache in general.

Methods

This study was part of a more comprehensive survey on neurological disorders of all people aged 65 years or over living in three rural villages near the town of L'Aquila (central Italy) on 1 March 1992.¹⁹

As previously reported,¹⁸ the survey was performed with a door to door two phase procedure. Participants who gave their informed consent were examined at home by a lay interviewer in the first phase, and by a neurologist in the second phase. Among the participants admitted to the second phase, we also included those who answered positively to the question "have you had a headache in the previous year". As well as the clinical and neurological examination, the screen positive participants underwent a standardised questionnaire designed to comply with the operational criteria of the headache classification of the IHS.¹⁰ The questionnaire was derived from that of Rasmussen *et al*² and included questions on frequency, duration, location, severity, characteristics, and accompaniments of headache, as well as questions on the use of medications for headache. The severity of headache attacks was classified as mild, moderate, or severe when the attacks caused respectively no, partial, or total interference with the normal daily life activities of each patient. To assess the frequency of attacks, we considered those with one or more attacks a month separately from those with less than one attack a month. Those with more than 15 attacks a month were classified as affected by CDH using the criteria proposed by Silberstein *et al*.²⁰

We included those with headache in the following three diagnostic subgroups: tension type headache (TTH), migraine headache (MH), and "other headaches." According to

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Table 1 One year prevalence rates (PR) of the different types of headache according to age and sex

	TTH			MH			Other headaches			Any headache		
	n	PR	95% CI	n	PR	95% CI	n	PR	95% CI	n	PR	95% CI
Sex:												
Women (n=470)	259	55.1	50.6–59.6	65	13.8	10.7–17.0	10	2.1	0.8–3.4	292	62.1	57.7–66.5
Men (n=363)	112	30.9	26.1–35.6	27	7.4	4.7–10.1	14	3.9	1.9–5.8	133	36.6	31.7–41.6
Age (y):												
65–74 (n=497)	243	48.9	44.5–53.3	61	12.3	9.4–15.2	19	3.8	2.1–5.5	282	56.7	52.4–61.1
75–84 (n=290)	117	40.3	34.7–46.0	30	10.3	6.8–13.9	4	1.3	0.0–2.7	131	45.2	39.4–50.9
85–96* (n=46)	11	23.9	11.6–36.2	1	2.2	0.0–6.4	1	2.2	0.0–6.4	12	26.1	13.4–38.8
All (n=833)	371	44.5	41.2–47.9	92	11.0	8.9–13.2	24	2.9	1.7–4.0	425†	51.0	47.6–54.4

Prevalence rates are cases/100 participants; TTH=tension-type headache; MH=migraine headache.

*Only two persons were older than 94.

†62 Patients with headache had both TTH and MH attacks.

the IHS classification criteria, those who reported more than one form of headache received a diagnosis for each distinct form. The TTH subgroup included patients with either episodic or chronic TTH, as well as patients who did not completely fulfil the IHS criteria for TTH (IHS code 2.3). The MH subgroup included patients with migraine with or without aura, as well as those affected by transformed migraine (TM). We did not consider as patients with migraine those reporting migraine aura symptoms without an accompanying headache. The subgroup of “other headaches” included patients with miscellaneous headaches (IHS code 4), new daily persistent headache, or hemicrania continua,²¹ as well as the patients affected by symptomatic headaches (IHS codes from 5 to 11) with the exclusion of the headaches caused by fever, hangover, lumbar puncture, or those that disappeared shortly after head traumas. We considered as symptomatic only headaches the onset of which occurred in close temporal relation to a possible causative organic factor.

The 1 year prevalence rates of headache in general and of its subgroups are presented as cases/100 participants. Age specific prevalence rates were calculated for three age groups: 65 to 74 years, 75 to 84 years, and 85 to 96 years (only two persons were older than 94). We calculated the 95% exact confidence intervals (95% CIs) using the binomial distribution. Mann-Whitney *U* test and χ^2 test were used when appropriate. A χ^2 test for trend was used to assess the age effects on prevalence rates. *p* Values <0.05 were considered as statistically significant.

Results

Of the 1147 eligible inhabitants, 968 (84.4%) gave their informed consent and completed the door to door study protocol. We did not include in the present study 135 examined persons because they were unable to complete the headache questionnaire owing to dementia (*n*=78), severe stroke related aphasia (*n*=8), or severe psychiatric disorders (*n*=49). Therefore, the participants comprised 833 (72.6%) of the 1147 eligible inhabitants. When compared with non-participants, participants had a similar proportion of women (56.4% and 58.9% respectively; χ^2 test, *p*=0.481) but were younger (mean age: 73.8 (6.2 SD) and 75.6 (7.1 SD) respectively; Mann-Whitney *U* test, *p*<0.001).

Four hundred and twenty five (51.0%) of the 833 participants reported one or more head-

ache attacks in the previous year. As shown in table 1, the 1 year prevalence of those with headache was significantly higher in women than men and decreased from the 65–74 through the 85–96 age group. The 1 year prevalence rates of the different types of headache were 44.5% for TTH, 11.0% for MH, and 2.9% for the “other headaches” subgroup. Prevalence rates were significantly higher in women than men in both TTH and MH subgroups, whereas no significant difference was found for the “other headaches” subgroup. The inverse association between headache prevalence and advancing age was significant in the TTH group (χ^2 for trend, *p*<0.001), nearly significant in the MH subgroup (χ^2 for trend, *p*=0.051), and not significant in the “other headaches” subgroup (χ^2 for trend, *p*=0.108).

Thirty eight (12.3%) of the 309 patients with TTH reported headache attacks that did not entirely fulfil the IHS criteria for TTH (IHS code 2.3). Of these 38 patients, 18 reported less than 10 attacks of headache, 11 had headache attacks associated with nausea or vomiting, and nine with phonophobia or photophobia. We included in the TTH subgroup 62 (67.4%) of the 92 patients with MH who also reported TTH attacks. Only two of the 92 patients with MH had migraine with aura; both these patients were women and younger than 75.

Of the 24 people included in the “other headaches” subgroup, 18 had symptomatic headaches, five had miscellaneous headaches, and one was affected by new daily persistent headache. Therefore, the 1 year prevalence of symptomatic headaches was 2.2% (95% CI 1.2–3.1). Of the 18 people with symptomatic headaches, five reported that their headaches had started after a stroke, three after a severe head trauma, and one after chronic administration of drugs for angina. In the remaining nine people, the headache was caused by trigeminal neuralgia (*n*=1), or was associated with glaucoma (*n*=2), disorders of the sinuses (*n*=2), kidney dialysis (*n*=1), meningioma (*n*=1), or sequelae of meningitis (*n*=2). Of the five people affected by miscellaneous headaches, two had external compression headache, two had benign cough headache, and one had cold stimulus headache. The patient with new daily persistent headache was a woman aged 69.

AGE OF ONSET OF HEADACHE

The onset of headache was reported after the age of 64 by 72 (16.9%) of the 425 patients. Of

Table 2 Distribution of severity of headache attacks in the different types of headache

	TTH (n=371)		MH (n=92)		Other headaches (n=24)		Any headache (n=425)	
	n	%	n	%	n	%	n	%
Mild	238	64.2	16	17.4	12	50.0	255	60.0
Moderate	133	35.8	38	41.3	11	45.8	131	30.8
Severe	0	0.0	38	41.3	1	4.2	39	9.2

TTH=Tension-type headache; MH=migraine headache.

these, 58 (80.6%) were affected by TTH, three (4.2%) by MH, and 11 (15.3%) by symptomatic headaches.

SEVERITY OF HEADACHE ATTACKS

One hundred and seventy (40.0%) of the 425 residents with headache reported that their attacks were usually moderate or severe. As shown in table 2, the proportion of patients with moderate to severe attacks was higher in patients with MH than in those with TTH (82.6% and 35.8% respectively, $p<0.001$). Furthermore, severe attacks were reported by 41.3% of the patients with MH and by none of the patients with TTH. The proportion of patients with moderate to severe attacks was significantly higher in women than men in TTH (40.2% and 25.9% respectively; $p=0.009$), but not in MH (86.2% and 74.1% respectively; $p=0.226$) and in the "other headaches" subgroup (40.0% and 57.1% respectively; $p=0.680$). The proportion of patients with moderate to severe headaches did not differ significantly between the three age groups in any of the subgroups.

The 1 year prevalence of patients with moderate to severe attacks was 16.0% (95% CI 13.5–18.5) for TTH, 9.1% (95% CI 7.2–11.1) for MH, and 1.4% (95% CI, 0.6–2.2) for the "other headaches" subgroup. The overall prevalence of patients with headache with moderate to severe attacks was 20.4% (95% CI 17.7–23.1) because 51 patients with MH also had moderate attacks of TTH.

FREQUENCY OF HEADACHE ATTACKS

One hundred and fifty (35.3%) of the 425 patients with headache reported one or more attacks a month. These patients accounted for 126 (34.0%) of the 371 patients with TTH, 32 (34.8%) of the 92 patients with MH, and 14 (58.3%) of the 24 patients with "other headaches" ($p=0.06$). The 1 year prevalence of patients with one or more attacks a month was 15.1% (95% CI 12.7–17.6) for TTH, 3.8% (95% CI 2.5–5.1) for MH and 1.7% (95% CI 0.8–2.6) for the "other headaches" subgroup. The overall prevalence of those with one or

more attacks a month was 18.0% (95% CI 15.4–20.6) because 22 patients with MH also had one or more attacks a month of TTH.

As shown in table 3, the proportion of patients with one or more attacks a month was higher in women than men in the TTH and MH subgroups, whereas in the "other headaches" subgroup the proportion of patients with one or more attacks a month was higher in men than women, although the difference was not significant. The proportion of patients with one or more attacks a month did not differ significantly between the three age groups in any of the headache subgroups.

Thirty seven (8.7%) of the 425 patients reported 15 or more attacks a month in the previous year. Therefore, the 1 year prevalence of patients with CDH was 4.4% (95% CI 3.0–5.8). Prevalence rates of CDH were higher in women than men (6.0% and 2.5% respectively, $p=0.016$), and did not differ significantly between the three age groups (χ^2 test for trend, $p=0.477$). Of the 37 patients with CDH, 21 had chronic TTH (57%), 13 (35%) TM, and three (8%) secondary headaches.

THERAPY

Of the 425 patients with headache 52 (12.2%) had not taken drugs for their headache attacks in the previous year, 195 (45.9%) had taken them regularly, and the remaining 178 (41.9%) had taken them only when the headache pain interfered with activities that could not be postponed. The 52 patients not taking drugs comprised 47 (15.2%) of the 309 patients with attacks of TTH alone, three (3.3%) of the 92 patients with MH, and two (8.3%) of the 24 patients with other headaches ($p=0.007$). Among patients with TTH, those not taking drugs accounted for 41 (18.1%) of the 227 patients with mild attacks, and for six (7.3%) of the 82 with moderate attacks ($p=0.032$), as well as for 35 (17.1%) of the 205 patients with less than one attack a month and for 12 (11.5%) of the 104 with one or more attacks a month ($p=0.266$). All three patients with MH not taking drugs had less than one attack a month, and the severity of attacks was mild in one and moderate in two. Of the two patients with "other headaches" not taking drugs, one had headaches secondary to kidney dialysis and one had headaches secondary to disorders of the sinuses.

Of the 37 patients with CDH, 14 (37.8%) took drugs without medication overuse, 14 (37.8%) took drugs with medication overuse, and the remaining nine (24.3%) did not take drugs for their headache attacks. These last

Table 3 Sex and age distribution of patients with one or more headache attacks a month

	TTH			MH			Other headaches		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
Women	103/259	39.8	33.8–45.7	27/65	41.5	29.6–53.5	5/10	50.0	19.0–80.1
Men	23/112	20.5	13.0–28.0	5/27	18.5	3.9–33.2	9/14	64.3	39.2–89.4
65–74	82/243	33.7	27.8–39.7	22/61	36.1	24.0–48.1	10/19	52.6	30.2–75.1
75–84	42/117	35.9	27.2–46.6	9/30	30.0	13.6–46.4	3/4	75.0	32.6–100
85–96	2/11	18.2	0.0–41.0	1/1	100.0	100	1/1	100.0	100
All	126/371	34.0	29.1–38.7	32/92	34.8	25.1–44.5	14/24	58.3	38.6–78.1

TTH=Tension-type headache; MH=migraine headache.

nine patients were all affected by chronic TTH, the severity of which was reported as mild by eight and as moderate by one patient. The 14 patients with medication overuse comprised nine (69.2%) of the 13 patients with TM and five (23.8%) of the 21 patients with chronic TTH ($p=0.009$). Of the nine patients with TM with medication overuse, six were taking drugs containing ergot compounds, and three were taking combinations of analgesic not containing ergot compounds. All the five patients with chronic TTH were taking combinations of analgesics, barbiturates, and caffeine.

Discussion

Some general aspects of our study need to be pointed out. All participants underwent a structured interview designed for the operational criteria of IHS, and all screen positive persons were examined in their homes by a neurologist. Therefore, our case ascertainment procedure is likely to have been more accurate than those performed by self administered questionnaires or telephone interviews. Our response rate was 84.4%, a figure sufficiently high for a field study. Furthermore, the decision to participate is unlikely to have been influenced by the presence of headache because our study was part of a more comprehensive survey on neurological disorders.¹⁹ However, our final inclusion rate was 72.6% after the exclusion of those unable to complete the headache questionnaire owing to dementia, stroke related aphasia, or psychiatric disorders. The exclusion of these persons might explain why participants were younger than non-participants.

In our study, the 1 year prevalence of headache in general was 51.0%. The prevalence rates were higher in women than men and decreased with advancing age. The low recall bias due to our case ascertainment procedure might explain why our prevalence rates were higher than those found in other studies on elderly people.^{5 6 8 22}

In our study, the 1 year prevalence of migraine was 13.8% in women and 7.4% in men, accounting for an overall rate of 11.0%. Six studies^{2 12-15 23} that used HIS criteria for the diagnosis of migraine found 1 year prevalence rates ranging from 3.4% to 7.5% in men and from 11.9% to 25.0% in women. However, only three of these studies^{13 15 23} included people over 65 and their rates of migraine prevalence in elderly people were slightly higher than those found in our study. Furthermore, our rates were markedly higher than the 0.3%-3% reported by three studies on Chinese populations.^{22 24 25} As only 5% of our population had more than 5 years of schooling,¹⁸ our data suggest that the low rates in Chinese populations are unlikely to be caused by their low level of schooling. In our population, the inverse association between age and MH prevalence only approached significance. In agreement with the data of the American migraine study,¹³ these findings suggest that the age related decrease in the prevalence of MH may be less pronounced after the age of 64.

In this elderly population, the 1 year prevalence of patients with TTH was 44.5% with higher rates in women than in men and in younger people. Our prevalence rates are slightly higher than those of other population based studies,^{7 16 17 22 26} but lower than the 61% found by Rasmussen *et al* in people aged 55-64 years.² In comparison with the data of Rasmussen *et al*,² our lower rates could be explained by the older age of our population and by the lower proportion of patients affected by both MH and TTH, which accounted for 66% of the patients with MH in our study, 75% in a study by Ulrich *et al*,²⁷ and 83% in that of Rasmussen *et al*.²⁸

On the other hand, we might have overestimated our TTH prevalence rates owing to the misclassification of some patients. In our study, 51 of the 133 patients with moderate TTH attacks also had migraine attacks. However, some of the remaining patients might have been classified as patients with migraine if we had examined them prospectively.

Furthermore, some patients with TTH, especially those who did not entirely fulfil IHS criteria for TTH and those with headache onset after the age of 64, might have been affected by symptomatic headaches. As we considered as symptomatic only headaches with onset in close temporal relation to a possible causative organic factor, we might have missed some symptomatic cases caused by diseases such as hypertension or cervical spine disorders.^{29 30} This possible misclassification and the exclusion of those unable to complete the headache questionnaire owing to dementia, stroke related aphasia, or psychiatric disorders could explain why our prevalence of symptomatic headache was only 2.2%. Despite these possible biases, our findings contrast with the clinical dictum that headaches in elderly people are often symptomatic.

In our study, the 1 year prevalence of patients that usually had moderate to severe attacks was 20.4%, a figure similar to the rates reported in other studies on elderly people.^{8 22} In agreement with data in the literature, we found that the proportion of patients with moderate to severe attacks was significantly higher among patients with MH than those with TTH. However, our data indicate that the impact of TTH on daily life activities should not be overlooked because this type of headache can cause attacks of moderate severity in 15.9% of elderly people. The proportion of patients with MH with moderate to severe attacks in our study was higher in women than men but, unlike other studies,³¹ the difference was not significant. We think that the few patients with MH could explain why significance was not reached.

In our study 35.3% of all patients reported one or less attacks a month in the previous year. This proportion is lower than the 44.5% of Passchier and Orlebeke,³² the 53.2% of Clarke and Waters,³³ and the 83.7% of Andrasik *et al*.³⁴ In comparison with the data of Rasmussen *et al*,² our proportion of patients with one or more attacks a month was higher in MH (34.8% *v* 24%) and lower in TTH (34.0% *v* 59%). We

think that different types of recall bias may explain these inconsistencies.

In our elderly population, the 1 year prevalence of CDH was 4.4%, with higher rates in women than in men. These findings are very close to the 3.9% found in an elderly Chinese population,³⁵ to the 4.1% found by Scher³⁶ in people aged 18 to 65 years, and by Castillo³⁷ in a random population sample. The findings suggest that the prevalence of CDH is unlikely to be influenced by age or by race. By contrast with data from headache centres,^{38–40} both our and the other population surveys^{35–37} found that patients with CDH were often affected by chronic TTH, suggesting that some patients with chronic TTH do not seek medical advice.

Data on the literature on medication habits are mainly based on headache prone populations. However, in a general population, Rasmussen²⁸ found that half of patients with MH and 13% of patients with TTH had not taken drugs in the previous year. These findings differ greatly from those of our study in which only 3.2% of patients with MH and 15.2% of patients with TTH had not taken drugs for their headache attacks in the previous year. We do not know whether this difference depends on a different medication habit in our population or on a low recall bias due to our door to door procedure. However, 41.9% of our patients with headache were reluctant to take drugs for every attack, particularly when they did not have to perform urgent daily life activities. This behaviour is probably caused by a fear of chronic use of any drug, as well as the belief that headache attacks should be endured like other inevitable events of everyday life.

In conclusion, our study confirms that a consistent proportion (51.0%) of elderly people was affected by primary headaches. Fortunately, the proportion of those affected by moderate or severe attacks was much lower (20.4%), and the proportion of those affected by CDH even lower (4.4%). However, more than one third (37.8%) of patients with CDH reported medication overuse, and 15.3% of the patients with onset of headache after the age of 64 were affected by symptomatic headaches. Therefore, our data suggest that consultation with a specialist would be particularly helpful in patients with moderate or severe headache attacks, CDH, or late onset of headache.

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