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Original article

Evaluation of the patterns of diagnostic and therapeutic care for first referrals at the Parma Headache Centre

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Abstract. *Background and aim of the work:* To evaluate the patterns of care for patients referred for the first time to a Headache Centre. *Methods:* A semistructured questionnaire was administered to all patients consecutively referred for the first visit to the Parma Headache Centre between 15 March and 28 September 2006. *Results:* The study included 202 patients, 55 men (27.2%) and 147 women (72.8%), mean age 40.6 years (41.8 for men and 40.2 for women). In 146 patients (72.3%), no diagnosis was made before. In the 56 patients (27.7%) with a prior diagnosis, there was concordance only in 16 cases (28.6%). The most common reason to get treatment at the Centre was having a specialistic opinion(n=81, 40.1%). Sixty-two patients (30.7%) came for worsening of headache and 50 pts. (24.8%) for recent headache onset. Nine patients (4.4%) came for other reasons. Only in 98 cases (48.5%) the physician's prescription was correct with an explicit "visit at Headache Centre" request. The average waiting time was 191.1 days (range, 0-270). The most prescribed tests were EEGs (33.5%, i.e. 47.2% for men and 44.2% for women) and brain CT-scans (28.7%, i.e. 49% for men and 34.6% for women). Out of the 27 patients already taking tryptans, 25 were found to have migraine and two cluster headache. The prescription of tryptan was correct. Most patients were already taking NSAIDs (n=174, 86.1%). Only one female patient was taking ergot derivatives and antiemetics. *Conclusions:* Management of care should be improved to reduce waiting lists and unnecessary tests. (www.actabiomedica.it)

Key words: Primary headache, headache centre, management, primary care, diagnostic evaluation, acute treatment, preventive treatment

Introduction

Headache is a disabling disorder that present severe consequences on individuals and society (1-3).

Cost-of-illness analysis (4) evaluates the economic costs of a disease as direct, indirect and intangible costs. Direct costs refer to medical care and represent the expenditures for medication, diagnostic tests, physician visits, and hospitalization. Indirect costs refer to paying for the use of resources with no direct expenditures, as in productivity losses related to sick leaves or reduced working capacity. Finally, intangible costs refer to the psychological pain, anxiety and emotional strain that both patients and their families experience as a result of illness (5).

While an abundance of data in the literature about the costs of primary headaches, particularly migraine is available, there is very scarce information on a headache sufferer's behaviour and choices before seeking treatment at a referral centre, such as the University of Parma Headache Centre that has been operating since 1975 as part of Italy's National Health Service (NHS).

The objective of this study was to evaluate: a) the reasons why patients decided to seek treatment at a referral centre; b) who recommended the visit at the

centre; c) the channels used by patients to book the visit; d) the waiting time between booking and receiving the visit; e) any diagnostic tests, physician visits or hospitalizations prior to the patients' first visit at the centre; f) any symptomatic and/or preventive drug or non-drug therapies prior to the patients' first visit at the centre; and g) who recommended the treatments – if any – administered before the patients' first visit at the centre.

Materials and methods

The study population comprised all patients consecutively observed for the first time at the University of Parma Headache Centre between 15 March and 28 September 2006.

Patients' data about gender, marital status, job, and province of residence were derived from their clinical records. The diagnoses were validated according to the criteria of the Second Edition of the International Classification of Headache Disorders (ICHD-II, 2004) by the Centre's headache neurologist who performed the visits. The data about the patients' health-care receiving process prior to their first visit at the Centre were gathered through 15-minute interviews by a specially trained physician (AB) using a semi-structured seven-section questionnaire. The answers to the questions in each section were pre-formulated to ensure a homogeneous data collection; only when the item "Other" was included in a section, could the patient give a different answer than the pre-formulated ones. The physician who compiled the questionnaire had to tick a box indicating whether the visit was "routine" or "urgent but deferrable". (In conformity with Italy's NHS, urgent but deferrable visits must be performed within seven days of the request.)

Each section of the questionnaire contained questions aimed at investigating a different aspect of health care provision to headache sufferers.

Section 1.1. What were the reasons that led patients to seek treatment at the Parma Headache Centre (headache that was persistent and/or unresponsive to drug therapy, headache of recent onset, worsening of a preexisting headache, or recent ER admission because of headache)?

Section 1.2. What did the prescribing physician write on the prescription and was the prescription correct? (From a strictly administrative point of view, access to the Headache Centre services is only possible when the name of the centre is explicitly indicated in the prescription.)

Section 1.3. Who – if any – had advised the patients to seek treatment at the Headache Centre? Possible options were a request by the patient's treating physician or a recommendation by a relative and/or a friend, the GP, the pharmacist, or other people.

Section 2.1. How had the visit been booked (by phone, through the Centralized Booking Service of the NHS's Local Health Unit, at the pharmacy, at the Hospital Reception Desk, or directly through a physician of the Centre)?

Sections 2.2 and 2.3. What were the visit appointment time and the waiting time in days between booking and receiving the visit?

Section 3.1. Based on the judgement of the Headache Centre's neurologist, was medical urgency real for so-called "urgent but deferrable" visits?

Section 3.2. What was the reason for the request of an urgent but deferrable visit (headache of recent onset, worsening of a pre-existing headache, recent ER admission, or too long waiting times)?

Section 3.3. What was the waiting time in days for urgent but deferrable visits?

Section 3.4. What did the prescribing physician write on the prescription with the request for an urgent but deferrable visit, and was the prescription correct?

Sections 4.1, 4.2, and 4.3. Did the patients undergo any physician visits, routine hospitalizations or ER admissions because of headache before their first visit at the Headache Centre? If so, the year when any of the above took place had to be reported.

Section 4.4. What diagnostic tests – if any – had been performed before the patients' first visit at the Headache Centre (brain CT-scan, neck CT-scan, brain MRI, neck MRI, brain angio-MRI, neck X-ray, skull X-ray, temporo-mandibular joint X-ray, EEG, or others)?

Sections 4.5, 4.6 and 4.7. What were the diagnoses – if any – made before the patients' first visit at the Headache Centre and why had the patients decided to change their treating physician/referral centre?

Sections 5.1 and 5.2. At the time of their first visit at the Headache Centre, were the patients taking symptomatic medication for their headache (tryptans, ergot derivatives, NSAIDs, antiemetics, or others)? If so, who had prescribed them (the GP, the ER physician, a neurologist or other specialist, the pharmacist, or others)?

Sections 6.1 and 6.2. Had the patients taken any preventive drug therapy (calcium-channel blockers, beta-blockers, tricyclic antidepressants, 5-HT2 receptor antagonists, antiepileptics, or others)? If so, who had prescribed them (the GP, a neurologist or other specialist)?

Sections 7.1 and 7.2. Had the patients received any non-drug therapy for their headache (relaxation techniques, transcutaneous electronic nerve stimulation, acupuncture, biofeedback, homeopathy, or others)? If so, who had recommended them (the patient him/herself, a friend and/or a relative, the GP, a neurologist or other specialist)?

The complete questionnaire is reported in Appendix 1.

The study was approved by the University of Parma Ethics Board. At the end of their visit at the Headache Centre, all patients gave their written consent to participation in the study.

Data were entered in a data base specially created using an English-language version of SPSS 14.0.

Statistical analysis was performed by chi-square test for percentage comparison and Student's t-test for mean comparison.

Results

Characteristics of the study population

The study population comprised 202 patients, including 55 men (27.2%) and 147 women (72.8%). Mean age at the first visit was 40.6 years (standard deviation [SD] ± 14.9 yrs), i.e. 41.8 years for men (SD ± 14.8 yrs) and 40.2 years for women (SD ± 15.0 yrs).

Skipped visits

The visits booked at the Parma Headache Centre throughout the study were 341, but 69 patients (20.2%), including 24 men (34.8%) and 45 women (65.2%), did not show up for the appointment. Mean age for the patients who skipped the visit was 38.0 years (SD ± 13.1 yrs), i.e. 35.0 years for men (SD ± 11.3 yrs) and 39.7 years for women (SD ± 13.8 yrs).

Diagnoses

The diagnoses made in the 202 patients who showed up for their first visit at the Headache Centre are reported in Table 1. No previous diagnosis of primary headache had ever been made in 146 of them (72.3%). Out of the 56 patients (27.7%) who came to the Centre with a previous diagnosis, only 16 pts. showed concordance between that diagnosis and the diagnosis made by our Centre's neurologist (28.6%). The comparison between previous diagnoses and the diagnoses made at our Centre is shown in Table 2.

Health-care receiving process

Why the visit was requested – The most common reason for patients to seek treatment at the Parma Headache Centre was to have counselling from a headache specialist (n=81, 40.1%). Sixty-two patients (30.7%) came because their pre-existing headache had worsened, 50 (24.8%) because they recently developed headache for the first time, and nine (4.4%) for different reasons than suggested in the questionnaire.

Who requested the visit – 45.5% of patients had the visit recommended by their GP; 23.8% (18.2% of men and 25.9% of women) requested the visit on their own initiative; 19.3% were referred by a specialist, often a local neurologist or an ER physician (in 4.8% and 4.4% of cases, respectively); 10.9% were advised by a relative or a friend; and one patient (0.5%) came to the Centre on a pharmacist's advice.

Why patients changed their headache care provider – 51 patients (25.2%) changed their treating physician/referral centre. Out of these, 22 pts. (43.1%) did so because they wanted to hear another headache specialist's opinion, 15 pts. (29.5%) because their headache had not improved or had even worsened, four pts.(7.8%) because they were not satisfied with previous visits, two pts. (3.9%) because they were now living in a different place, and eight pts. (15.7%) for

Table 1. Type of headache in patients referred for the first time to the Parma Headache Centre

Diagnosis	Males n (%)	Females n (%)	Total n (%)
Migraine with aura	4 (7.3%)	6 (4.1%)	10 (5.0%)
Migraine with aura + migraine without aura	2 (3.6%)	7 (4.8%)	9 (4.5%)
Migraine with aura + tension-type headache	0	1 (0.7%)	1 (0.5%)
Migraine without aura + cluster headache	0	1 (0.7%)	1 (0.5%)
Migraine without aura	23 (41.8%)	91 (61.9%)	114 (56.4%)
Migraine without aura + tension-type headache	3 (5.5%)	10 (6.8%)	13 (6.4%)
Migraine without aura + Other*	0	3 (2.0%)	3 (1.5%)
Tension-type headache	6 (10.9%)	10 (6.8%)	16 (7.8%)
Tension-type headache + Other*	1 (1.8%)	2 (1.4%)	3 (1.5%)
Cluster headache	1 (1.8%)	3 (2.0%)	4 (2.0%)
Probable migraine without aura or tension-type headache**	4 (7.3%)	3 (2.0%)	7 (3.5%)
Other	11 (20.0%)	10 (6.8%)	21 (10.4%)
Total	55 (100%)	147 (100%)	202 (100%)

* Other = Other forms of headache
** Probable migraine without aura or tension-type headache = Headache that does not fulfil the ICHD-II criteria

Table 2. Comparison of the diagnoses made before and after the visit at the Parma Headache Centre

Diagnosis	Before the visit n	After the visit n
Migraine without aura	11	33
Migraine with aura	6	2
Tension-type headache	5	13
Cluster headache	6	4
Probable migraine without aura or tension-type headache*	5	0
Secondary diagnosis	10	4
No diagnosis	13	0

* Probable migraine without aura or tension-type headache = Headache that does not fulfil the ICHD-II criteria

other reasons. **How the prescription was compiled** – Only in 98 cases (48.5%) the physician's prescription was correctly compiled, i.e. it explicitly reported the request for a "visit at a Headache Centre". In 19 cases (9.4%) the prescribing physician had written "neurological visit", and in two (1%) "headache visit". In as many as 83 cases (41.1%), the physician's prescription was wrong because it merely indicated symptoms or diagnostic options.

How the visit was booked – Visits were generally booked by phone. In particular, 126 patients (62.3%) dialled the toll-free number of the Parma University Hospital, and 65 pts. (32.2%) the number of the Centralized Booking Service of the NHS's Local Health Unit. There were also sporadic cases of patients booking their visit at a pharmacy (n=4, 2%), at the Hospital Reception Desk (n=2, 1%), or directly through a physician of the Headache Centre (n=5, 2.5%).

How long patients had to wait for the appointment – The mean waiting time for the first visit at the Headache Centre was 191.1 days (range, 0- 270).

Visits classified as "urgent but deferrable" – 15 "urgent but deferrable" visits were booked throughout the study (5.5%). The main reasons for booking this kind of visit were headache of recent onset (33.3%), worsening of a preexisting headache (26.7%), or recent ER admission for headache (33.3%). The mean waiting time for these visits was 18.4 days (range, 2-90). None of the requests for an urgent but deferrable visit was considered correct by the Headache Centre's

neurologist, not even in one case with cluster headache, because the patient was in remission. The diagnoses for the 15 patients (6 men and 9 women) who requested these visits were: migraine without aura (n=6, 2 men and 4 women), migraine with aura (n=2; 1 man and 1 woman), tension-type headache (n=3; 1 man and 2 women); cluster headache (n= 1; 1 woman only); other headache forms (n=3; 2 men and 2 woman).

Prior physician visits, "routine" hospitalizations, and ER admissions for headache – Out of all the patients who came to the Headache Centre for their first visit, 49 pts. (24.3%) had already been seen one or more times by local neurologists or at other specialized centres; 15 patients (7.4%) had been hospitalized for headache, and as many as 53 pts. (26.2%) had sought ER care at least once for a headache attack.

Prior diagnostic tests

The most frequently prescribed diagnostics tests before the patients' first visit to the Headache Centre were EEGs (33.5%, i.e. 47.2% for men and 44.2% for women), followed by brain CT-scans (28.7%, i.e. 49.0% for men and 34.6% for women). The diagnostic tests taken in male and female patients are reported in Table 3. Eight tests were of a different kind than indicated in the questionnaire, including orthopantography (n=1), blood prolactin test (n=1), lumbar puncture (n=1), facial skeleton CT-scan (n=1), paranasal sinus CT-scan (n=1), and sonography of the supraaortic trunks (n=3).

Prior symptomatic and preventive drug or non-drug therapies

Twenty-seven of the patients seeking treatment at the Headache Centre were already taking tryptans as preventive drug therapy, including 25 with migraine and two with cluster headache. Triptan prescription was then correct in all cases. Most patients were taking NSAIDs at the time of their first visit (n=174, 86.1%). Only one patient was taking ergot derivatives and antiemetics. Symptomatic therapy was prescribed in 83.1% of cases (n=168) by the GP and in 9.9% by a specialist. In 15 cases (75.0%) the prescribing specialist was a neurologist, and in one case each (5%) a gastroenterologist, a gynaecologist, an ENT specialist, a dental surgeon, and a rheumatologist. In four cases (1.9%) the symptomatic medication was prescribed by the ER physician, in one case only it was suggested by the pharmacist, and in the remaining nine cases (4.5%) the patients took it on other people's advice. Thirty-six patients (17.8%) had taken preventive drug therapy before their first visit at the Centre, namely calcium-channel blockers (n=18), tricyclic antidepressants (n=12), antiepileptics (n=3), and beta-blockers (n=2). Only one patient had taken serotoninergic drugs. Preventive therapy was prescribed by a neurologist in 19 cases (52.8%) and by the GP in 16 (44.4%). Only in one patient the preventive therapy was prescribed by the ER physician (2.8%). At the time of their first visit at the Centre, only 18 patients (8.9%) reported having tried preventive non-drug therapies, including acupuncture (n=8, 44.4%) and homeopathy (n=8, 44.4%). Only two patients had tried relaxation

Table 3. Diagnostic tests taken before the first visit at the Parma Headache Centre

	Males n (%)	Females n (%)	Total n (%)
Brain CT-scan	27 (49.0%)	51 (34.6%)	78 (28.7%)
Neck CT-scan	1 (1.8%)	6 (4.0%)	7 (2.6%)
Brain MRI	15 (27.2%)	35 (23.8%)	50 (18.3%)
Neck MRI	1 (1.8%)	8 (5.4%)	9 (3.3%)
Brain angio-MRI	4 (7.2%)	2 (1.4%)	6 (2.2%)
Neck X-ray	13 (23.6%)	35 (23.8%)	48 (17.6%)
Skull X-ray	16 (29.0%)	31 (21.0%)	47 (17.3%)
Temporomandibular joint X-ray	4 (7.2%)	7 (4.8%)	11 (4.0%)
EEG	26 (47.2%)	65 (44.2%)	91 (33.5%)

techniques or transcutaneous electrical nerve stimulation. These treatments were suggested by friends and/or relatives in seven cases, were taken on the patient's own initiative in five, and were prescribed by a specialist in four and by the GP in two.

Discussion

Medical literature on health care provision to headache patients seeking treatment at specialized centres is scarce because few studies have ever been carried out in this field.

Some data can be derived from the yearly reports of the University of Copenhagen Headache Centre in Glostrup (Denmark) (7). With more than 800 physician visits every year, the volume of clinical care provided by this Centre in 2005 is not comparable to that of our Centre in Parma. The Glostrup Centre manages an out-patient service, a day hospital with six beds, and a staff consisting of four neurologists, three physical therapists, three psychologists, three psychiatrists, three gynaecologists, three dental surgeons, and four secretaries. By contrast, our Parma Centre has just two neurologists supported by three resident physicians.

The patients referred to the Glostrup Centre have an older mean age (44 yrs; range, 8-93) than those referred to the Parma Centre (40.6 yrs). In Denmark, too, there are more women than men seeking treatment at referral centres, reflecting the higher prevalence of primary headaches in females (8.9), even though the difference between the number of women and men requesting a visit at a Headache Centre is less marked in Denmark (F:M ratio, 2:1) than in Italy (F:M ratio, 2.7:1). This difference is likely determined by cultural factors that lead to different patients' attitudes in the two countries.

The diagnoses made in 2005 in the Glostrup Centre were: migraine (36.8%), tension-type headache (16.0%), headache from medication overuse (15.5%), cluster headache (7.8%), trigeminal neuralgia and other neuralgias (4.8%), and other headache forms (19.1%). By contrast, the diagnoses made at the patients' first visit at our Parma Centre were: migraine without aura (68.9%), migraine with aura (10.3%), tension-type headache (16.3%), cluster headache (2.5%), mixed headache (3.5%), and other headache forms (13.4%). The discordance between the two sets of data is not due to a different incidence of headache in the two countries, but rather to the fact that the diagnosis of headache is based almost solely on data from the patients' past medical histories, because there are no absolute or objective criteria to rely on.

The health-care receiving attitudes of subjects with primary headache have been partially described by some epidemiological surveys.

Not all patients who have severe attacks go to see a doctor: in a recent study by Lipton et al. (10), 60% of women with migraine who had never been seen by a physician for their headache reported severe or very severe attacks, and 68% reported disabling attacks or need for bed rest. Moreover, not all migraine patients who see a doctor receive an accurate diagnosis: again, in the Lipton et al. study (10), 42% of the patients who had seen a doctor received an uncertain diagnosis.

In another study carried out in the United States (11), only 41% of women and as few as 29% of men with migraine had their headache diagnosed by a doctor.

Not all patients who have seen a doctor once continue to see the doctor regularly. In a recent survey carried out in Great Britain, 43% of patients had quit treatment (12): out of these, only 31% had received an effective therapy, 23% thought that their doctor couldn't do anything for their headache, and 25% believed that in any event the doctor could be of no help. Moreover, visits at the doctor's office tend to become less frequent over time: in a series of patients at the Mayo Clinic in Rochester, Minn. (USA) (13), 74% had regularly seen the doctor in the year following their diagnosis of migraine, but this proportion had dropped to 21% by the third year from diagnosis. Among the possible reasons why patients quit treatment, investigators have proposed: a reduction in the frequency and severity of attacks; lack of satisfaction with the treatments received; the feeling that physicians underestimate the problems of patients with migraine; the lack of physician's knowledge of headache; and the lack of adequate explanations and reassurances (14).

This may explain why in our study the percentage of subjects who requested a visit at our Headache Centre on their own initiative was so high. GPs, who

ideally should know the health conditions of patients in their practice and should be those who refer headache sufferers to specialized centres, requested the visit in less than half of cases.

The poor concordance between any previous diagnoses and the diagnoses made by our Centre's neurologist (16/56) may also partially explain why 60 patients (29.7%) eventually changed their treating physician or referral centre. Another reason for the change is possibly the hope of finding a new treatment that might suppress headache for ever or finding a physician that could discover the cause of the headache. About half of these patients said they changed in order to hear a different opinion.

It is interesting to note that less than half of the requests for a visit at our Headache Centre were correctly written. In most cases, the physician's prescription indicated symptoms or diagnostic options, or contained a request for a neurological visit.

The most common way to book the visit was by phone, probably out of convenience. Booking through the Hospital Reception Desk, a pharmacy booking system or directly through a physician of the Centre was rarely used, probably because not all patients knew about the existence of these booking channels.

The mean waiting time between booking and receiving the first visit at the Centre was 191.1 days and probably this data, that is consistent with the mean waiting time in other Headache Centres in Emilia Romagna, reflect the lack of a definite guideline for the management of primary headache. Trying to shorten this time by requesting an urgent but deferrable visit is not a correct procedure, not even if previous attacks were so severe that patients had to seek ER care. There are few valid reasons for requesting an urgent but deferrable visit, namely: a cluster headache attack at the beginning of the cluster period, status migrainosus, or prolonged aura.

Now, if we consider the health-care receiving process of headache sufferers in terms of direct costs, i.e. the organizational and operating costs directly related to illness, it is easy to see from our study – as well as from other studies in the literature – that headache patients, particularly migraineurs, do not go to see a specialist when they develop their headache (10, 12, 15).

Mean age of patients referred for the first time to our Headache Centre was 40.6 years, while age at headache onset is usually comprised between the second and the third decade of life.

During the visit, it is frequent to hear patients say: "I've been suffering for years, but now I can't stand it any more", or "So far I've been able to control my headache with drugs fairly well, but now they're no longer enough".

Based on data in the literature, the most important reasons why a patient will not go to see a doctor are carelessness (in as much as 55% of cases) and having already tried an effective treatment, while 16% of patients think that there are no useful medical treatments for their headache (16).

The probability of a headache patient seeing a doctor is higher among women, increases with age, and also depends on the characteristics of headache – it is higher among patients with severe, frequent, and disabling attacks (10).

In our study, the number of patients who did not show up for the visit appointment is high. The possible causes are: 1) the waiting time between booking and receiving the visit is too long; 2) at the time of the visit patients feel much better than when they booked the visit; 3) patients forget the appointment; 4) patients have already obtained a visit privately.

Four US studies have investigated the use of ER services by migraine patients (15, 17-19). Three of these studies (15, 17, 19) demonstrated comparable rates of ER admissions: 14%, 16%, and 18% of migraineurs, respectively. The fourth study (18) reported that almost half of migraine patients had sought ER care at least once, but these were patients that had participated in a clinical trial and in all likelihood represented a highly selected population.

On the other hand, the frequent recourse to ER services in North America may be the result of regional health systems that do not provide mandatory GP coverage for all citizens. Patients then often seek ER care because this is the way they can make their first contact with a physician. It is estimated that in the US, the yearly cost of ER admission is 0.13-0.34 USD for each patient with a verified diagnosis of migraine (20).

The patients that sought ER care in our study were 53 (26.2%). Access to ER service is easy: often a

hospital's ER is the first health care service patients can find to treat their headache attacks, especially if these attacks are so severe that they cannot be controlled by common analgesics. However, seeking ER care for an attack of the "usual" headache is not correct, either from the point of view of health care provision – because an attack of migraine without aura does not constitute a medical emergency and can be treated by the GP – or from the point of view of clinical management – because symptomatic treatments are generally ineffective in the advanced stage of an attack.

Hospitalization for migraine is relatively infrequent – medical literature reports a 7% rate in the US (12) and a 2% rate in Denmark (21) – increases with age, and is more common in the female population (18). The yearly average cost of hospitalization for patients with a verified diagnosis of migraine in the US is 6 USD for men and 16 USD for women (20). Also in North America, estimates for Canada were 1,788 hospitalizations in a year for a total of 6,973 days in hospital at a cost of 1,938,619 CAD (22).

In Italy, the NHS's expenditure for headache in 1988, referred to the health care activities of the Pavia-based Mondino Institute, was 1,495,624.1 EUR for routine hospitalizations and 48,564.5 EUR for day hospital services (23).

Our data demonstrate that hospitalization is rare for headache patients, who request it primarily to combat medication addiction or, much less frequently, for further diagnostic tests (7.4%). The figures in our study are nonetheless higher than in Denmark, where only 2% of the population has been hospitalized at least once for headache (21), but are comparable with those in the US, which report a hospitalization rate of 7% (18).

Our study also demonstrates that too many diagnostic tests are prescribed to headache patients. Firstly, a headache diagnosis must be based on careful data collection from the patients' past medical histories and only rarely are diagnostic tests effectively necessary.

According to US guidelines, there is no need to perform neuroimaging tests in headache patients with normal neurological examinations. In two studies performed on tension-type headache patients with negative neurological examinations, neuroimaging tests did not reveal any significant lesions (24).

EEG, too, is not a test that should be requested for diagnostic evaluation of headache patients (25).

The few available studies demonstrate a wide variability of results, probably reflecting the different cultural attitudes of physicians in the different countries, also with respect to the implications of possible medical law suits. Thus, while in a Danish study (21) only 2% of migraine patients underwent an EEG, a brain CT-scan or X-rays, in a US study (26) 34% of patients underwent a brain CT-scan, 14% a paranasal sinus X-ray, and 3% an EEG over just 22 months. In an Italian study (27) carried out in patients referred to headache clinics and therefore representing highly selected populations, each migraine patient underwent an average of 2.1 exams in the 12 months preceding the study. In most cases, these exams were brain CT-scans and EEGs.

Changing the prevailing health-care culture could mean huge cost savings for the individual citizen and the community as a whole.

Almost all headache sufferers take drugs for acute treatment of their attacks – 83% of women and 94% of men do, according to a recent Canadian population-based study (28). Three recent studies (17, 28, 29) also demonstrated that a very high percentage of patients (61% to 84%) solely or primarily take OTC drugs, while prescription drugs are much less used, even in cases of severe migraine. The prescribed medication is represented by drug combinations containing butalbital and/or caffeine in 36% of cases and by tryptans in 20% (16). The expenditure for medication is fairly low (24% and 30% of total direct costs for men and for women in the US, respectively) (20), but the appearance on the market of tryptans – a class of drugs specifically developed for treatment of migraine attacks – is driving up costs. (The estimated yearly expenditure for prescription drugs in the United States is about 300 million USD (20).) Since tryptans are specific for migraine, their previous use by patients seeking treatment at our Headache Centre was correct in all cases, demonstrating good knowledge of this class of drugs by the prescribing GPs.

Use of NSAIDs is more debatable. In most cases, they were OTC formulations that did nor require a physician's prescription. NSAID use is often uncontrolled, leading to ineffective treatments or to overuse

which may eventually require hospitalization to combat the patient's addiction.

In the severest cases, the best therapeutic strategy is actually preventive therapy, which can generally be prescribed almost solely by specialists. In our study only a small minority of the patients referred for the first time to our Headache Centre had previously received preventive drug therapy and an even smaller proportion had tried preventive non-drug therapies, including acupuncture, which was the most widely used and also the most effective of these therapies.

In some countries, a high percentage of migraine patients use alternative medicine – acupuncture, chiropractics, and homeopathy. In a Dutch study, about 80% of direct costs were related to alternative medical treatments (30). These treatments may be beneficial to tension-type headache, but are less effective in migraine and totally useless in cluster headache (31). Also in consideration of their huge costs, they should hopefully be prescribed only when necessary. Patients should also be advised that these treatments do not "work miracles", but may just help relieve their symptoms.

Present-day management of headache patients is not easy: only a minority of subjects with headache go to see their doctor or a headache specialist. Sometimes, headache is not easily classifiable, either for the physician or for the patient. Moreover, OTC and combination drugs are often not enough to treat symptoms, eventually leading to headache from medication overuse. The relationship between the patient and the GP, the local neurologist or a headache specialist then becomes crucial. What headache patients need most is to feel that their doctors understand them and will support them through all the steps of the health-care receiving process. They also need effective treatments that are easily orally administered. On the other hand, it is not easy to have headache patients understand that they may need preventive medication to be daily taken because symptomatic drugs may not be enough. It is the responsibility of their doctors to explain them the reasons for preventive therapy and to encourage sceptical patients to be confident about future improvements (32). There are no specific studies on the best way to manage headache patients, but the Danish guidelines indicate what experts believe is the ideal health-care receiving process for these patients. In the case of first-time headache sufferers, it is GPs who have to determine whether their patients can be treated at home or need to be seen by a specialist in order to exclude an organic disease after taking all the necessary blood and diagnostic tests. Quite different is the case of long-time sufferers. These patients may choose to see their doctor or go directly to a specialist. In either case, physicians must prescribe all the necessary tests or medical consultations to establish a diagnosis and then ensure that their patients have correctly understood the nature of their disorder and the course of treatment to follow. They must also ensure that patients feel at any time that there is someone who understands and helps them. In some cases, hospitalization may be necessary to combat a patient's medication addiction or to receive therapies that cannot be administered at home and to monitor any new treatment (33).

Conclusions

Our study demonstrates that the health-care receiving process of headache patients referred to a typical Headache Centre in Northern Italy is characterized by:

- an excessive number of diagnostic tests
- long waiting times
- good use of symptomatic medication by GPs, while preventive medication is almost solely prescribed by headache neurologists

The management of diagnostic and therapeutic care of headache patients should be improved in order to reduce waiting lists and the frequency of unnecessary diagnostic tests. Achieving this goal will be possible if GPs and general neurologists take care of all symptomatic headache cases and, in general, of headache cases that are more easily manageable, freeing up specialized referral centres to focus on treatment for those cases of primary headache that are difficult to diagnose or manage, or are unresponsive to therapy.

References

1. Lipton RB, Hamelsky SW, Stewart WF. Epidemiology and impact of headache. In: Silberstein SD, Lipton RB,

Dalessio DJ, eds. Wolff's Headache and Other Head Pain. Oxford: University Press; 2001: 85-108.
2. Stewart WF, Lipton RB, Simon D. Work-related disability: results from the American migraine study. *Cephalalgia* 1996; 16: 231-8.
3. Smith R. Impact of migraine on the family. *Headache* 1998; 38: 423-6.
4. Turchetti G, Malorgio G. Il Costo Sociale dell' Emicrania. *Business International – The Economist* 1999; n. 9/99.
5. Manzoni GC, Nappi G. Manuale delle cefalee. Milano. Masson, 2005; 1-15.
6. Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders, 2nd edn. *Cephalalgia* 2004; 24: 1-160.
7. Lyngberg AC, Rasmussen BK, Jørgensen T, Jensen R. Incidence of primary headache: a Danish epidemiologic follow-up study. *Am J Epidem* 2005; 161: 1066-73.
8. Rasmussen BK. Epidemiology of headache. *Cephalalgia* 1995; 15: 45-68.
9. Lipton RB, Stewart WF. Prevalence and impact of migraine. *Neurol Clin* 1997; 15: 1-13.
10. Lipton RB, Stewart WF, Simon D. Medical consultation for migraine: results from the American Migraine Study. *Headache* 1998; 38: 87-96.
11. Lipton RB, Stewart WF, Celentano DD, Reed ML. Undiagnosed migraine headaches. A comparison of symptom-based and reported physician diagnosis. *Arch Intern Med* 1992; 152: 1273-8.
12. Lipton RB, Scher AI, Steiner TJ, et al. Patterns of health care utilization for migraine in England and in the United States. *Neurology* 2003; 60: 441-8.
13. Stang PE, Osterhaus JT, Celentano DD. Migraine. Patterns of healthcare use. *Neurology* 1994; 44: 47-55.
14. Micieli G. Suffering in silence. In Edmeads J, ed. Migraine: a brighter future. Worthing: Cambridge, Medical Publications 1993; 1-7.
15. Edmeads J, Findlay H, Tugwell P, Pryse-Phillips W, Nelson RF, Murray TJ. Impact of migraine and tension-type headache on life-style, consulting behaviour, and medication use: a Canadian population survey. *Can J Neurol Sci* 1993; 20: 131-7.
16. Lipton RB, Scher AI, Kolodner K, Liberman J, Steiner TJ, Stewart WF. Migraine in the United States: epidemiology and patterns of health care use. *Neurology* 2002; 58: 885-94.
17. Celentano DD, Stewart WF, Lipton RB, Reed ML. Medication use and disability among migraineurs: a national probability sample survey. *Headache* 1992; 32: 223-8.
18. Osterhaus JT, Gutterman DL, Plachetka JR. Healthcare resource and lost labour costs of migraine headache in the US. Pharmacoeconomics 1992; 2: 67-76.
19. Scott ES, Shearer SW. Pharmacoeconomic impact of injectable sumatriptan on migraine-associated healthcare costs. *Am J Man Care* 1996; 2: 139-43.
20. Hu XH, Markson LE, Lipton RB, Stewart WF, Berger ML. Burden of migraine in the United States: disability and economic costs. *Arch Intern Med* 1999; 159: 813-8.
21. Rasmussen BK, Jensen R, Olesen J. Impact of headache on sickness absence and utilisation of medical services: a Danish population study. *J Epidem Community Health* 1992; 46: 443-6.
22. To T, Wu K. Health care utilization and disability of migraine: the Ontario Health Survey. *Can J Public Health* 1995; 86: 195-9.
23. Sances G, Sandrini G, Costa A, Antonaci F, Citterio A, Nappi G. Headache in the Diagnosis-Related Groups (DRG) era: management and appropriateness of admission. *Funct Neurol* 2000; 15: 224-9.
24. Frishberg BM, Rosenberg JH, Matchar DB, McCrory DC, Pietrzak MP, Rozen TD, Silberstein SD for the US Consortium. Evidence-based guidelines in the primary care setting: neuroimaging in patients with nonacute headache www.aan.com/public/practiceguidelines
25. Gronseth GS, Greenberg MK. The utility of the electroencephalogram in the evaluation of patients presenting with headache: a review of the literature. *Neurology* 1995; 45: 1263-7.
26. McMillan JA, Martin BC, Jankel CA. Migraine-related utilization and costs in a medicaid population. Ninth Annual Meeting of the Association for Health Services Research, Chicago, Illinois, 11 June 1992.
27. Granella F, Manzoni GC, Ambrosio LA, et al. Studio epidemiologico multicentrico sulle cefalee essenziali. Analisi delle variabili socio-demografiche e dei costi sociali. XI Congresso Nazionale della Società Italiana per lo Studio delle Cefalee, Lipari 30 Sept. -2 Oct. 1993, p. 51
28. Forward SP, McGrath PJ, MacKinnon D, Brown TL, Swann J, Currie EL. Medication patterns of recurrent headache sufferers: a community study. *Cephalalgia* 1998; 18: 146-51
29. Sakai F, Igarashi H. Prevalence of migraine in Japan: a nationwide survey. *Cephalalgia* 1997; 17: 15-22.
30. Van Roijen L, Essink-Bot ML, Koopmanschap MA, Michel BC, Rutten FF. Societal perspective on the burden of migraine in The Netherlands. *Pharmacoeconomics* 1995; 7: 170-9.
31. Cui S, Siow HC, Lo YL, Lum SY, Xu PC. Effection of acupuncture treatment on migraineurs. *Cephalalgia* 2007; 27: 1189.
32. MacGregor EA, Brandes J, Eikermann A. Migraine prevalence and treatment patterns: the global Migraine and Zolmitriptan Evaluation survey. *Headache* 2003; 43: 19-26.
33. The Danish Neurological Society and the Danish Headache Society Guidelines for the management of headache. *Cephalalgia* 1998; 18: 9-22.

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Appendix 1 – Questionnaire

1.
Why was the visit requested?
Recent onset of persistent headache and/or headache unresponsive to drug therapy
Worsening of a preexisting headache
ER admission for a headache attack
Other

1.2 Who requested the visit?
The patient him/herself
A relative and/or a friend
The GP
A specialist (please specify)
The pharmacist

2.
2.1 How was the visit booked?
By phone
Through the Centralized Booking Service of the NHS's Local Health Unit
Through a pharmacy booking service
At the Hospital Reception Desk
Self-booked
2.2 Type of request
2.3 Wating time days
2.4 Time of appointment hr:min

3.
3.1 Urgent but deferrable visit Yes No
3.2 Why was an urgent but deferrable visit requested?
Recent onset of persistent headache and/or headache unresponsive to drug therapy
Worsening of a preexisting headache
ER admission for a headache attack
Other
3.3 Waiting time days
3.4 Type of request
3.5 Correctness of physician's prescription Yes No

4.
4.1 Previous physician visits for headache Yes No
If "Yes": When? year
Where?
4.2 Previous routine hospitalizations for headache Yes No
If "Yes": When? year
Where?
4.3 Previous er admissions for headache Yes No
If "Yes": When? year
Where?
4.4 What diagnostic tests did the patient take before the visit?
Brain CT-scan
Neck CT-scan
Brain MRI
Neck MRI
Angio-MRI
Neck X-ray
Temporomandibular joint X-ray
EEG
Other

4.5 what was the patient's primary diagnosis before the visit?
Migraine with aura
Migraine without aura
Tension-type headache
Cluster headache
4.6 What was the patient's secondary diagnosis before the visit?
Sinusitis
Dyspepsia
Psychiatric disorders
Cervical arthritis
Other
4.7 Why did the patient change his/her treating physician or referral centre?
Lack of improvement and/or worsening of the headache
Poor physician/patient compliance
Desire for a new and/or different medical opinion
Change of residence
Other

5.
5.1 What sympomatic medication did the patient take before the visit?
Tryptans
Ergot derivatives
NSAIDs
Antiemetics
5.2 Who prescribed the symptomatic medication?
The GP
The ER physician
A specialist (please specify)

6.
6.1 Preventive drug therapy before the visit Yes No
If "Yes", which one?
Calcium-channel blockers
Beta-blockers
Tricyclic antidepressants
5-HT2 receptor antagonists
6.2 Who prescribed preventive drug therapy?
The GP
A specialist (please specify)

7.
7.1 Preventive non-drug therapy before the visit Yes No
If "Yes", which one?
Relaxation techniques
Transcutaneous electrical nerve stimulation
Homeopathy
Massage
Acupuncture
Other
7.2 Who recommended preventive non-drug therapy?
The patient him/herself
A friend and/or a relative
The GP
A specialist (please specify)