

## The burden of headache: global and regional prevalence of headache and its impact

Headache is a universal symptom. However, despite its prevalence and implications for daily living, headache epidemiology and its public health impact have only been partially documented. Most research has focused on migraine, with data on tension-type headache (TTH) being relatively sparse, especially for countries outside Western Europe and North America (1).

### Headache diagnosis

Headache can be the symptom of a number of primary headache disorders, most commonly migraine and TTH. Cluster headache is also important because of the severity of the associated pain.

Headache diagnosis is made following careful questioning, and physical and neurological examination (Figure 1), supported by knowledge of the distribution of the different headache disorders within the population. A physical examination of patients with headache will generally produce normal findings (2). Red flags that raise suspicion of a more serious underlying organic disease process are listed in Box 1.

Migraine headaches typically last between 4 and 72 h and have at least two of the following characteristics: unilateral location; pulsating quality; moderate or severe intensity and aggravation by routine physical activity such as walking or climbing stairs. In addition, the headache may be accompanied by nausea and/or sensitivity to light and sound. According to the International Headache Society, migraine is diagnosed if a person has at least five attacks fulfilling these criteria (3).

Some 10% of migraineurs experience aura with every attack, and a third will have aura with some attacks (4). These are sensory disturbances that cause changes in vision and/or other neurological symptoms. Typical aura symptoms spread gradually over 5 min and can last for up to 1 h. Several such symptoms can follow in succession before the actual headache begins (4). This can make it difficult for physicians to distinguish between migraine and TTH. Chronic migraine is different. To fulfil the definition of chronic migraine, patients must experience a minimum of 15 or more headache days per month, for 3 or more months, with the headache meeting the criteria for migraine on 8 days or more (3).

Tension-type headache is significantly more common than migraine, as shall be discussed in more detail later on. TTH usually causes bilateral pain of mild-to-moderate intensity. The pain is described as a pressing or dull ache, with attacks lasting between 30 min and 7 days.

These attacks are not accompanied by typical migraine characteristics such as nausea or aggravation by physical activity. For TTH to be diagnosed, the patient needs to have experienced at least 10 headache episodes (3).

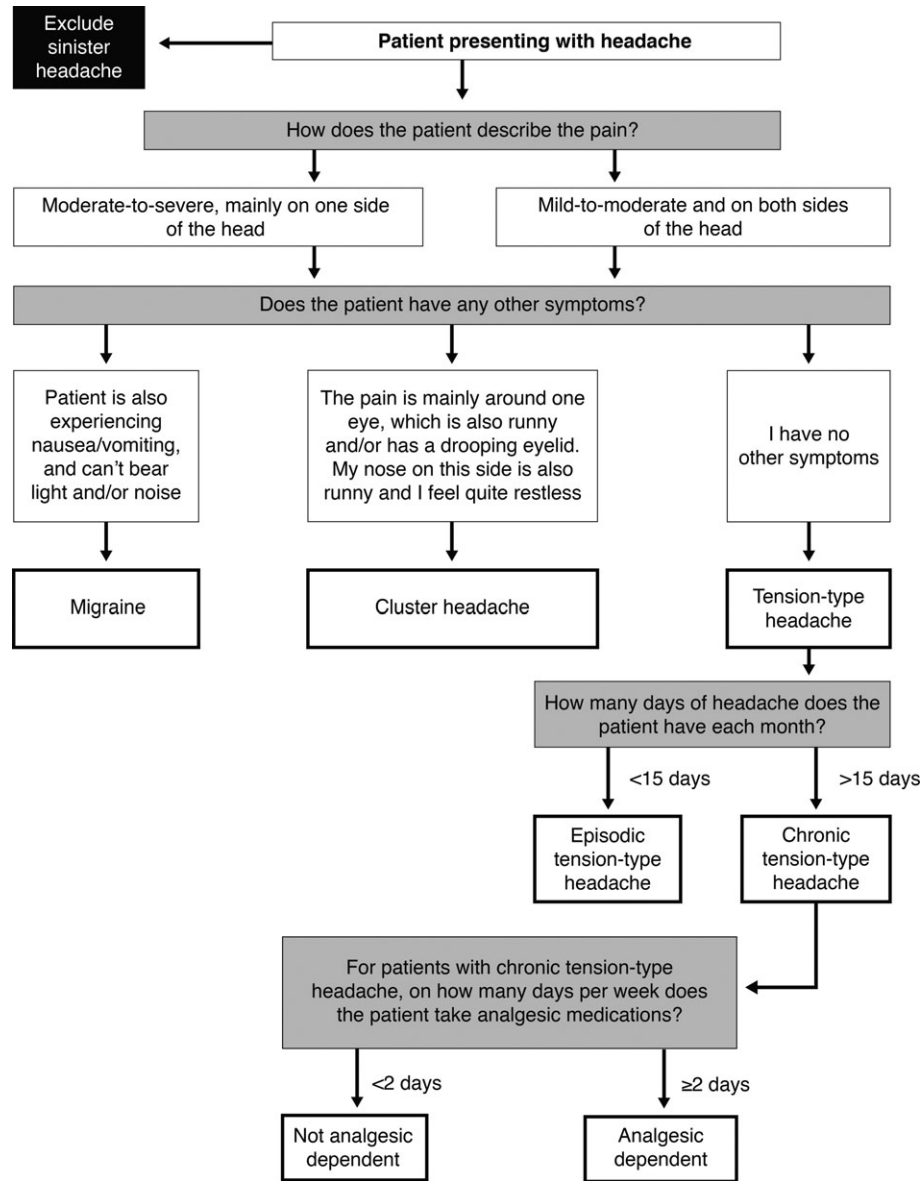
The International Classification of Headache Disorders (ICHD) further classifies TTH into episodic and chronic TTH forms. Episodic TTH is defined by attacks occurring fewer than 15 times per month (infrequent episodic: < 1 attack per month; frequent episodic: 1–14 attacks per month). If the headaches occur more frequently than 15 or more days per month and last for longer than 4 h, the condition is considered to be chronic.

The diagnosis of chronic headache can be complicated by several types of headache being present simultaneously (e.g. chronic TTH with intermittent migraine attacks). However, the pain quality and features of these headaches tend to be distinctly different.

Migraine and TTH can also be aggravated by the chronic overuse of analgesics to treat the headache or other pain. All available acute medications can have this effect (4). It is therefore important to establish a patient's frequency, regularity and duration of analgesic intake. Approximately half of patients who experience headaches on 15 or more days per month for more than 3 months will have medication-overuse headache (3). Withdrawal of the overused analgesic tends to bring improvement of the symptoms (3).

The third of the primary headaches, cluster headache, is associated with excruciating pain on one side of the head only, usually around the eye and temple area, but it can also spread to other regions (3). The pain is so severe that patients tend to become agitated during an attack – in contrast to migraine where sufferers often feel better lying down. Unlike TTH, cluster headache attacks are accompanied by at least one other symptom such as redness of the eye, excessive tearing, nasal congestion and facial sweating

**Poor management of TTH calls for greater patient education, which pharmacy staff are perfectly placed to provide**



**Figure 1** Headache diagnosis algorithm. Figure adapted from IHS 2013 (3)

**Box 1.** Symptoms and signs indicating the need for further investigation (5).

- Worsening headache with fever.
- Abrupt onset (maximum severity within 5 min).
- New-onset neurological deficit.
- New-onset cognitive dysfunction.
- Change in personality.
- Impaired level of consciousness.
- History of head trauma within 6 weeks.
- Headache triggered by cough, valsalva, sneeze or exertion.
- Headache that changes with posture.
- Suspected meningitis, glaucoma or temporal arteritis.

– usually presenting on the same side of the head as the headache (3).

Cluster headaches normally occur in periods lasting 2–12 weeks, with up to eight attacks per day that last 15–180 min each (3). The majority of patients have episodic cluster headache, where cluster periods are separated by remission periods of at least 1 month. Chronic attacks are defined as clusters lasting for more than 1 year without remission, or where the remission periods are shorter than 1 month. However, it should be noted that cluster headache is typically a lifelong condition, regardless of whether the condition falls into the episodic or chronic category.

Cervicogenic headache is caused by a disorder of the cervical spine and its components; bony, disc and/or soft tissue elements usually, but not always, associated with neck pain (3). As a result of the overlapping symptoms, and association of both headaches with pain sources in the neck, differentiating between TTH and cervicogenic headache can be diagnostically challenging. According to the ICHD, features that can help differentiate cervicogenic headache from TTH include the presence of side-locked pain and headache, which is exacerbated by pressing the fingers into the neck muscles and by head movement (3). The typical pattern of pain in cervicogenic headache radiates from the back to the front of the head. Sufferers may also experience migrainous features such as nausea, vomiting and photo/phonophobia (3).

### The burden of TTH

The burden of TTH is substantial. A literature survey found that, globally, 46% of the adult population have an active headache disorder, with 11% experiencing current migraine and 42% having current TTH (1). The available prevalence data indicate that headache disorders may be more common in Europe than in other regions of the world; however, it is unclear whether this finding is attributable to variations in study methods. The estimated prevalence of migraine was 15% for Europe – three times higher than that reported in Africa (5%). For TTH, the regional differences were even wider, with 80% of people affected in Europe compared with 20–30% in Asia or the Americas (1). Data from Africa and Australia were lacking.

The global data also showed that TTH is more common than migraine across all age groups, includ-

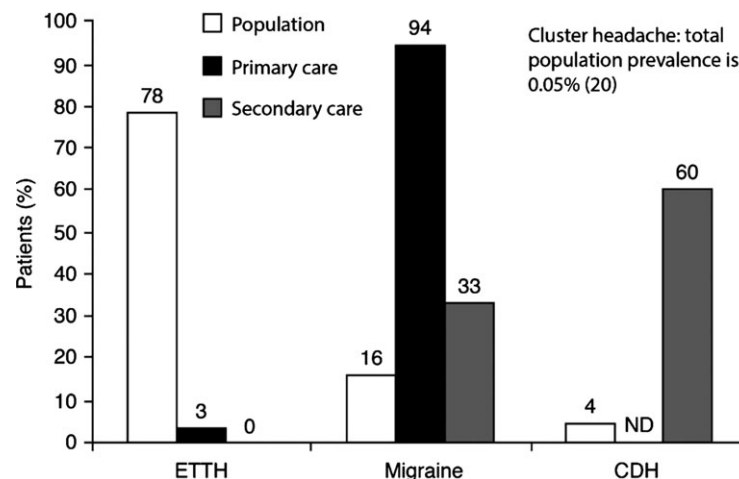
ing children (1,6). As children get older, their likelihood of experiencing TTH increases (7). This type of headache is slightly more common in women than in men.

Although TTH is generally considered to be less disabling than migraine, it places a larger burden on society overall. In the global survey (1), intensity was used as a proxy measure for disability, giving a global mean disability score of 1.4 for migraine and 0.6 for TTH on a scale of 0–3. However, once this was multiplied by the frequency of headache attacks (headache days per person in the population), TTH – because of its greater prevalence and frequency – contributed more to the global headache burden than migraine (58% vs. 42%, respectively).

A survey conducted in seven European countries and Russia revealed that headache is one of the most frequent types of everyday pain (8). TTH in particular affects one in 10 people on a weekly basis (9). Reported effects of headache in Europe include a reduction in productivity by almost 25% (10) and an increase in depression and anxiety (11).

Data from other parts of the world are sparse, but evidence from China, South Korea, Brazil, New Zealand, Ethiopia and Jordan confirms that TTH is a prevalent condition that affects daily activities and well-being.

Tension-type headache also places a financial burden on society and individuals. The Eurolight project estimated a mean annual cost in the European Union of €21 billion because of episodic TTH, or €303 per person with this condition (12). Among the direct costs, the top contributor was outpatient care (€11 per person). Notably, the indirect costs of TTH were considerably higher, accounting for 92% of the financial burden. These indirect costs were attributable to



**Figure 2** Prevalence of different headache conditions. CDH, chronic daily headache; ETTH, episodic tension-type headache; ND, not determined. Figure adapted from Dowson 2003, Rasmussen et al. 1991, Tepper et al. 2004 and BASH 2010 (15,18–20)

reduced productivity at work (€173 per person) and increased workplace absenteeism (€105 per person).

## Healthcare use

Despite the frequency and burden of TTH, many people with headache do not consult a physician for advice. According to an analysis of general practice records in the UK, only 4% of adults who visited their GP during 1992–2000 were reported to have a headache disorder (13). This finding could be because of failure to record visits as headache consultations, or it could reflect the fact that most patients with headache opt not to consult a GP.

The majority of people with headache who choose not to consult a primary care physician have migraine, TTH or the two conditions combined (14). The consultation frequencies for migraine and TTH do not necessarily reflect the true distribution of these two headache types. In some regions of the world, for example, Europe, the Americas and Southeast Asia, patients presenting with a headache disorder in primary care are as likely to have migraine as TTH, although TTH is by far the more common disorder (14).

Globally, up to 10% of patients with headache are treated at the secondary care level (14). These tend to be patients with chronic daily headache (60% of consultations at a specialist clinic in the UK) or migraine (33% of consultations, Figure 2) (15).

Overall, the evidence shows that a large proportion of patients with TTH do not have any contact with a healthcare professional. WHO data confirm that around half of those suffering from headache are self-treating and do not consult a physician (14). However, there remains a social responsibility to ensure all patients with TTH are treated correctly and receive appropriate advice from healthcare professionals. The available data on the burden of TTH confirm that this headache should not be written off as simple inconvenience undeserving of medical care (16).

TTH therefore presents already overstretched healthcare systems with a major challenge. Steiner et al. carried out a needs assessment based on the assumption that 120,000 adults and 15,000 children per 1,000,000 people living in Europe require headache care, and that the needs of 90% of these patients can be met in primary care. They estimated that the equivalent of 28–29 full-time primary care practitioners are required to provide headache care for a pop-

ulation of 1,000,000, corresponding to approximately 34,500 patients per primary care practitioner (17). This academic exercise suggests that a large unmet need exists in both Europe and the UK, where GPs currently cover approximately 2000 patients for all illnesses. To reduce the demand on GP services, it seems logical to suggest that community pharmacists could play an increased role in TTH care, acting as the first point of healthcare contact for patients with this common headache. Most headache management requires no more than a basic knowledge of a few common disorders (17), and pharmacists are ideally placed to educate patients with headache about efficient and effective treatment strategies.

## Conclusion

In summary, TTH is a ubiquitous condition that is highly prevalent in the community and has a large impact on people's lives and society as a whole. However, patients are generally not seen in primary practice, with many sufferers opting to self-treat with over-the-counter medications. Patient education about how to treat TTH effectively and efficiently is therefore crucial.

As an accessible, community-based healthcare resource, pharmacists can play a key role in providing such education and in improving medical care for patients with TTH. To support pharmacists in this advisory role and help them recognise and understand TTH better, appropriate professional education is vital.

## Disclosure

AD has consulted and lectured for a number of pharmaceutical companies (including Reckitt Benckiser) for activities related to headache, and received research support from charities, government and industry sources at various times.

A. Dowson  
Kings College Hospital, Bromley, UK

Correspondence to:  
Dr Andrew Dowson,  
Kings College Hospital, PRUH Site, Bromley, UK.  
Tel.: + 016898 65872  
Fax: 01428 712546  
Email: dr.dowson@btconnect.com

## References

1 Stovner LJ, Hagen K, Jensen R, et al. The global burden of headache: a documentation of headache prevalence and disability worldwide. *Cephalalgia* 2007; 27: 193–210.

2 Bendtsen L, Birk S, Kasch H, et al.; Danish Headache Society. Reference programme: diagnosis and treatment of headache disorders and facial pain. Danish Headache Society, 2nd edition, 2012. *J Headache Pain* 2012; 13(Suppl. 1): S1–2S9.

3 Headache Classification Committee of the International Headache Society (IHS). The International Classification of Headache Disorders, 3rd edn (beta version). *Cephalalgia* 2013; 33: 629–808.

- 4 Steiner T, Paemeliere K, Jensen R, et al. European principles of management of common headache disorders in primary care. *J Headache Pain* 2007; **8**: S3–47.
- 5 National Institute for Health and Care Excellence. Headaches. Diagnosis and Management of Headaches in Young People and Adults. Clinical Guideline 150, September 2012. <http://www.nice.org.uk/nicemedia/live/13901/60854/60854.pdf> (accessed May 2014).
- 6 Anttila P. Tension-type headache in childhood and adolescence. *Lancet Neurol* 2006; **5**: 268–74.
- 7 Laurell K, Larsson B, Eeg-Olofsson O. Prevalence of headache in Swedish schoolchildren, with a focus on tension-type headache. *Cephalalgia* 2004; **24**: 380–8.
- 8 Vowles K, Rosser B, Januszewicz P, et al. Everyday pain, analgesic beliefs, and analgesic behaviours in Europe: an epidemiological survey and analysis. *Eur J Pain* 2009; **13**: S233.
- 9 Jensen R, Stovner LJ. Epidemiology and comorbidity of headache. *Lancet Neurol* 2008; **7**: 354–61.
- 10 Bigal ME, Bigal JM, Betti M, Bordini CA, Speciali JG. Evaluation of the impact of migraine and episodic tension-type headache on the quality of life and performance of a university student population. *Headache* 2001; **41**: 710–9.
- 11 Zwart JA, Dyb G, Hagen K, et al. Depression and anxiety disorders associated with headache frequency. The Nord-Trøndelag Health Study. *Eur J Neurol* 2003; **10**: 147–52.
- 12 Linde M, Gustavsson A, Stovner LJ, et al. The cost of headache disorders in Europe: the Eurolight project. *Eur J Neurol* 2012; **19**: 703 e43.
- 13 Latinovic R, Gulliford M, Ridsdale L. Headache and migraine in primary care: consultation, prescription, and referral rates in a large population. *J Neurol Neurosurg Psychiatry* 2006; **77**: 385–7.
- 14 WHO. *Atlas of Headache Disorders and Resources in the World 2011*. Geneva, Switzerland: WHO, 2011.
- 15 Dowson AJ. Analysis of the patients attending a specialist UK headache clinic over a 3-year period. *Headache* 2003; **43**: 14–8.
- 16 Martelletti P, Steiner TJ, Bertolote JM, Dua T, Saraceno B. The definitive position of headache among the major public health challenges. An end to the slippery slope of disregard. *J Headache Pain* 2007; **8**: 149–51.
- 17 Steiner TJ, Antonaci F, Jensen R, et al.; European Headache Federation; Global Campaign against Headache. Recommendations for headache service organisation and delivery in Europe. *J Headache Pain* 2011; **12**: 419–26.
- 18 Rasmussen BK, Jensen R, Schroll M, Olesen J. Epidemiology of headache in a general population: a prevalence study. *J Clin Epidemiol* 1991; **44**: 1147–57.
- 19 Tepper SJ, Dahlof D, Dowson A, et al. Prevalence and diagnosis of migraine in patients consulting their physician with a complaint of headache: data from the Landmark Study. *Headache* 2004; **44**: 856–64.
- 20 British Association for the Study of Headache (BASH). Guidelines for all Healthcare Professionals in the Diagnosis and Management of Migraine, Tension-Type Headache, Cluster Headache, Medication Overuse Headache, 3rd edn (1st revision), 2010. [www.bash.org.uk](http://www.bash.org.uk) (accessed May 2014).

Paper received June 2014, accepted November 2014