Diagnosis, Epidemiology, and Impact of Tension-type Headache

Rigmor Jensen, MD

Address
Danish Headache Center, Department of Neurology, University of Copenhagen, DK-2600 Glostrup, Denmark.
E-mail: rigj@glostruphosp.kbhamt.dk

Current Headache Reports 2003, **2:**455–459
Current Science Inc. ISSN 1539–3291

Although tension-type headache is the most prevalent headache and affects 78% of the general population, the substantial societal and individual burden associated with this primary headache has been overlooked. In contrast to migraine headache, there has been limited focus on tension-type headache. Most patients with the chronic form of tension-type headache, which affects 3% of the population, are left virtually without any specific treatment. Chronic tension-type headache differs from the episodic form in frequency, lack of effect to most treatment strategies, more medication overuse, and more loss of quality of life. Daily or near daily headaches also constitute a major diagnostic and therapeutic problem and distinguishing chronic tension-type headache from migraine headache and from medication-induced headache is a substantial diagnostic challenge because management strategies are completely different. Considerable benefits for the society can be gained by specific strategies leading to reductions in the amount of sickness absence and impaired working abilities. The burden on the affected patients' and their families' quality of life also may be improved by a general acceptance of the disorder and by the development of a specific treatment strategy.

Introduction

Tension-type headache is the most prevalent headache disorder. Similar to most other prevalent disorders, the mechanisms behind tension-type headache are widely unknown and treatment strategies remain unspecific.

With the introduction of the International Headache Classification (IHS) in 1988 [1], tension-type headache was the term designated to describe what previously was called tension headache, muscle contraction headache, psychomyogenic headache, and stress headache. The IHS classification clearly delineated and defined the disorder and distinguished between an episodic type, which occurs on less than 50% of all days, and a chronic form, which occurs on 50% of all days or more and in most cases daily (Table 1). Thus, the disease has been defined clearly, which has made it possible to study it scientifically and to obtain research results that are useful throughout the world.

Chronic tension-type headache differs from the episodic form in frequency, lack of effect to most treatment strategies, more medication overuse, and more loss of quality of life than the episodic form, which is the most prevalent and thus more costly to the society. Daily or near daily headaches also constitute major diagnostic and therapeutic problems. Distinguishing chronic tension-type headache from migraine headache and chronic tension-type headache from medication-induced headache is a substantial diagnostic challenge because management strategies are completely different. Most patients with daily headaches have more than one type of headache (*ie,* one or two primary headaches and some secondary headaches) and, as in all of the other medical disciplines, a specific diagnosis is crucial for a specific treatment. In particular are the secondary headaches, which are extremely important to recognize because they are completely treatable or they are serious conditions. Treatment of a migraine headache attack also may be quite different from treatment of an episode of tension-type headache.

The diagnostic criteria of headaches with daily occurrence have been intensely debated and it has been suggested that tension-type headache and migraine headache share some common biology [2–5]. In some ways, these primary headache disorders may be phenotypically related because of the frequent coexistence in severely affected patients from specialized headache clinics [4]. However, population studies paint a different picture [3,6••,7–9]. The latter studies show that tension-type headache and migraine headache differ in gender ratio, age distribution, and clinical presentation [3,6••,7–9]. Therefore, it could be argued that the "continuum theory" is an artifact of referral bias, thereby mimicking a continuum [2,4,5]. Thus, it is most likely that migraine headache and tension-type headache are different disorders, although some traits are shared, which also is true of migraine headache and cluster headache. Because episodes of tension-type headache are more pronounced and frequent, although not more prevalent in patients with coexisting migraine headache than in nonmigraineurs [3,8,9], migraine headache may be a precipitating factor to tension-type headache in genetically predisposed patients and likely vice versa.

Table 1. Diagnostic criteria for tension-type headache

Episodic form (Code 2.1)	Chronic form (Code 2.2)
A. Headache frequency < 180 days yearly Fulfill criteria B through D below	Headache frequency > 180 days yearly
B. Episodes lasting from 30 minutes to 7 days	
C.* At least 2 of the following pain characteristics: Pressing/tightening (nonpulsating quality) Mild or moderate severity Bilateral location Not aggravated by walking stairs or similar routine physical activity	
D. Both of the following: No nausea or vomiting Photophobia or phonophobia	Both of the following: No vomiting No more than one of the following: Nausea, photophobia, or phonophobia
E.* At least one of the following: History and physical and neurologic examinations do not suggest one of the disorders listed in group 5–11 (symptomatic disorders) History and physical and neurologic examinations suggest such a disorder, but is ruled out by appropriate investigations Such a disorder is present, but tension-type headache does not occur for the first time in close temporal relation to the disorder	

*Identical criteria for both subforms.

Diagnosis

Tension-type headache is characterized by mild to moderate pain occurring in short episodes of variable duration or continuously (chronic form). The headache often is bilateral pressing or tightening pain and is never associated with typical migraine headache features such as vomiting, severe photophobia, and phonophobia (Table 1). Only one of these accompanying symptoms are allowed in the chronic form, although they usually are of mild to moderate intensity and are not as pronounced as they are in migraine headache [10]. A diagnosis of a primary headache such as tension-type headache requires exclusion of other organic disorders. The absence of specific and distinguishing features of tension-type headache may explain why physicians, and subsequently patients, question the diagnosis; however, migraine headache symptoms are more characteristic. In severely affected patients from tertiary pain centers, it can be difficult to give a precise diagnosis at the initial consultation because most patients with daily headaches may mimic migraine headache, tension-type headache, and some overuse of analgesics and migraine headache-specific drugs at the same time. Therefore, a general and neurologic examination and a prospective follow-up using diagnostic headache diaries with registration of all of the consumed drugs [11] are of utmost importance to make the diagnosis.

Because of the lack of positive specific symptoms, paraclinical investigations to exclude other organic diseases are performed more frequently in tension-type headache than in other headaches such as migraine headache or cluster headache. Fever, neck stiffness, abnormal neurologic signs, or personality changes are never seen with tension-type headache. A careful history to uncover coexisting depression, anxiety, and other disorders also are extremely important [12•,13,14]. If an intracranial lesion is suspected on the basis of a clinical history or examination, a computed tomography or magnetic resonance imaging should be performed. There are no other reliable paraclinical tests that are useful in the differential diagnosis. Although unspecific, a thorough manual palpation of the pericranial muscles and tender insertions also can be recommended [15–17] to demonstrate the peripheral muscular factor for the patients and to plan the treatment strategy, in which physical training and relaxation therapy are important components.

Secondary causes of headache are summarized in Table 2. In clinical practice, the most frequent cause for chronic daily headache is chronic analgesic or ergotamine or triptan abuse, to which patients may evolve after having presented initially with migraine headache or episodic/chronic tension-type headache [18,19•]. Although the mechanism of drug-induced headache is unclear, it is a widespread phenomenon complicating the primary headache disorders and may affect up to 50% of patients in some headache clinic populations [18,19•]. Recognizing this condition is crucial because it has been demonstrated that the prognosis is very favorable and that a short time interval between the onset of drug abuse and first withdrawal is the most important predictor for a favorable long-term outcome [18,19•].

Epidemiology

Tension-type headache varies considerably in frequency and duration, from rare short-lasting episodes of discomfort to frequent, long-lasting or even continuous disabling headaches. In its milder and infrequent forms, tension-type headache is a nuisance and is not regarded as a disease by the affected patients or their doctors. In its frequent forms, the

Table 2. Prevalence of tension-type headache (1988 International Headache Society criteria)

Country, *y*	Age groups, *y*	Episodic tension-type headache, %	Chronic tension-type headache, %
Denmark, 1991	25–64	71	3
Germany, 1994	18–70	38	2.5
United States, 1998	18–65	38.3	2.2
Chile, 1998	> 14	24.3	2.6
Spain, 1999	> 18	N/A	2.6
Hong Kong, 2000	> 14	26.9	1
China, 2000	> 65	N/A	2.7

N/A–nonapplicable.

headache becomes distressing and socially disturbing, which is similar to other primary headaches such as migraine headache or cluster headache. Therefore, pooling these extremes together in an overall prevalence may be misleading. The lifetime prevalence of tension-type headache was as high as 78% in a population-based study in Denmark, but 59% of the patients had tension-type headache 1 day each month or less and were not in specific need of medical attention and cannot be regarded as headache patients [6••]. Nevertheless, 24% to 37% had tension-type headache several times each month, 10% had it weekly, and 2% to 3% of the population had chronic tension type headache that usually lasted for the greater part of a lifetime [6••,7,20,21,22••,23–26] (Table 2). The global prevalence of chronic tension-type headache is uniform (2% to 3% in most studies) [6••,7,20,21,23,24,26] (Table 3). In Chile, tension-type headache represents 72.3% of all headaches [24].

In the relatively selected populations in which tension-type headache has been reported, the prevalence also is rather uniform. In young students at a Brazilian university, the prevalence of episodic tension-type headache was 32.9% [27], 34.5% in a Dutch manufacturing setting [28], and 32.1% in a population of medical students in Brazil [29]. In 1329 Swedish twins, the prevalence of episodic tension-type headache was as low as 9.4%, but the prevalence of migraine headache also was markedly lower than in most other published studies [30].

The male:female ratio of tension-type headache is 4:5, indicating that, unlike migraine headache, women are only slightly more affected [6••,7,22••]. In both sexes, the prevalence seems to peak between the ages of 30 and 39 years and then declines with increasing age [6••,7,22••]. The average age of onset of tension-type headache is 25 to 30 years in cross-sectional epidemiologic studies, which is higher than in migraine headache [6••,7,22••]. The mean duration of tension-type headache has been reported to be 10.3 years in a German population study [7] and 19.9 years in a clinical study [15], illustrating the lifetime consistency and considerable referral bias in this disorder.

The prognosis of tension-type headache has been scarcely analyzed and never in longitudinal epidemiologic designs. In a clinical 10-year follow-up study of 62 patients, 75% of those with episodic tension-type headache continued to be episodic, but 25% had evolved into the chronic form. In those with initial chronic tension-type headache, 31% remained chronic, 21% had developed medication overuse, and the remaining 48% had reversed to the episodic form with or without prophylactic treatment [31]. Depression, anxiety, and medication overuse were predictors for a poor outcome. In a former cross-sectional clinical study, most of the patients with chronic tension-type headache had evolved from the episodic form during a period of many years [32], confirming numerous pathophysiologic studies that indicate that, on the basis of peripheral and central sensitization of the pain system, patients with frequent episodes of headache are at risk for suffering from chronic and treatment-resistant forms of tension-type headache [33–35].

Impact of Tension-type Headache

Because of its high prevalence, tension-type headache has a greater socioeconomic impact than any other type of headache. The direct costs include medical costs and social services; indirect costs cause lost production in the economy because of morbidity. Intangible costs include reduced quality of life. Because headache attacks reduce work capability quite significantly, the socioeconomic costs from absenteeism among patients with tension-type headache is quite substantial. The total loss of work days each year because of tension-type headache is 820 days per 1000 employees compared with 270 days per 1000 employees as a result of migraine headache [36•]. In Denmark, tension-type headache, especially the chronic type, accounts for more than 10% of total disease absenteeism caused by any disease [36•]. In a US study, migraineurs were much more likely to report absenteeism from work; tension-type headache accounted for a large proportion of decreased work effectiveness [37•]. Impaired or abolished working capacities and social activities also were reported by 60% of patients with tension-type headache in the Danish population-based study [36•]. In a university student population in Brazil, a profound impact of episodic tension-type headache was noted in productivity, physical capacity, and performance, although this was not as evident in those fewer students suffering from migraine headache [29]. Although chronic tension-type headache is not the most visible disease, it is

Table 3. Differential diagnosis of tension-type headache

Other primary headaches	Secondary headaches	
	With structural lesions	Without structural lesions
Migraine	Brain tumor	Medication overuse
Cluster headache or other trigeminal-autonomic headaches	Hydrocephalus	Influenza headache
	Idiopathic intracranial	Alcohol headache
	Hypertension	Post-traumatic headache
	Meningitis or other neuroinfections	Cough headache
	Subarachnoid hemorrhage	Nitrate headache
	Stroke	Hypoglycemia
	Temporal arthritis	Depression
	Glaucoma	Anxiety

one of the most costly to the society, costing roughly four times more than epilepsy.

The direct costs caused by medical services and medications are scarcely analyzed. These headache patients apparently seek less medical attention than migraineurs because only 16% of patients with tension-type headache have been in contact with their general practitioner because of the headache in contrast to 56% of migraineurs [36•]; however, when data are corrected for the much higher prevalence of tension-type headache, the total use of medical contacts are 54% higher for tension-type headache than for migraine headache. In Chile, consultation rates for tension-type headache sufferers were 39% compared with 63% for migraineurs and younger age or moderate to severe pain in patients with tension-type headache increased the likelihood of medical consulting [38]. Because of the lack of specific and effective treatment for tension-type headache, over-the-counter drugs were used most frequently for tension-type headache [36•,39]. Despite the profound impact on their daily activities, 14% of the patients with tension-type headache had not used analgesics in the past year [36•]. Although aspirin or paracetamol usually cause symptomatic relief in episodic tension-type headache, no satisfactory treatment is available for the frequent or chronic form. Furthermore, the intake of analgesics for more than approximately 10 days each month may worsen this headache because of medication overuse [19•]. These patients usually seek many doctors and spend large amounts of money on so-called alternative treatments, but basically have to live most of their lives with the headache without effective pain relief [40].

The individual impact of tension-type headache encompasses physical suffering, loss of quality of life, and economic effect, but is more difficult to quantify than impact on the society. In a study by Holroyd *et al.* [12•], it was demonstrated that chronic tension-type headache had a profound negative effect on the emotional life of the affected patients; they were seven times more likely than control subjects to be classified as impaired on all of the subscales of the applied quality-of-life instruments, which is similar or even worse than other patients with well-accepted chronic pain diagnosis.

Conclusions

The substantial societal and individual burdens associated with tension-type headache constitute a major public health issue that has been overlooked previously [40]. Considerable benefits for the society can be gained by specific strategies leading to reductions in the amount of sickness absence and impaired working abilities. Likewise, the burden on the affected patients' and their families' quality of life may be improved by a general acceptance of the disorder and by the development of a specific treatment strategy. Tension-type headache also has been overlooked by the pharmaceutical industry for many years because the industrial focus has been directed into new migraine headache drugs. The most prevalent group of headache patients continue to be left virtually without any specific attention. Therefore, much more focus on this widespread disorder is needed.

References and Recommended Reading

Papers of particular interest, published recently, have been highlighted as:

- • Of importance
- •• Of major importance

1. Headache Classification Committee of the International Society: **Classification and diagnostic criteria for headache disorders, cranial neuralgias, and facial pain.** *Cephalalgia* 1988, **8(suppl 7):**1–98.
2. Leston JA: **Migraine and tension-type headache are not separate disorders.** *Cephalalgia* 1996, **16:**220–223.
3. Rasmussen BK: **Migraine and tension-type headache are separate disorders.** *Cephalalgia* 1996, **16:**217–220.
4. Goadsby P, Boes C: **Chronic daily headache.** *J Neurol Neurosurg Psychiatry* 2002, **72 (suppl 2):**2–5.
5. Silberstein SD, Lipton RD, Solomon S, Mathew NT: **Classification of daily headaches or near daily headaches: field trial of revised IHS criteria.** *Neurology* 1996, **47:**871–875.
6. •• Rasmussen BK, Jensen R, Schroll M, Olesen J: **Epidemiology of headache in a general population: a prevalence study.** *J Clin Epidemiol* 1991, **44:**1147–1157.

The first prevalence study of primary headaches based on the IHS criteria, a significant reference study for subsequent epidemiologic studies.

7. Goebel H, Petersen-Braun M, Soyka D: **The epidemiology of headache in Germany: a nationwide survey of a representative sample on the basis of the headache classification of the International Headache Society.** *Cephalalgia* 1994, **14:**97–106.

8. Rasmussen BK: **Migraine and tension-type headache in a general population: precipitating factors, female hormones, sleep pattern, and relation to lifestyle.** *Pain* 1993, **53:**65–72.
9. Ulrich V, Russell MB, Jensen R, Olesen J: **A comparison of tension-type headache in migraineurs and in non-migraineurs: a population-based study.** *Pain* 1996, **67:**501–506.
10. Rasmussen BK, Jensen R, Olesen J: **A population-based analysis of the criteria of the International Headache Society.** *Cephalalgia* 1991, **11:**129–134.
11. Russell M, Rasmussen BK, Brennum J, *et al.*: **Presentation of a new instrument: the diagnostic headache diary.** *Cephalalgia* 1992, **12:**369–374.
12. • Holroyd KA, Stensland M, Lipchik GL, *et al.*: **Psychosocial correlates and impact of chronic tension-type headache.** *Headache* 2000, **40:**3–16.

An important, meticulous, and large study of well-characterized patients.

13. Rasmussen BK: **Migraine and tension type headache in a general population: psychosocial factors.** *Int J Epidemiol* 1992, **21:**1138–1143.
14. Mitsikostas DD, Thomas AM: **Comorbidity of headache and depressive disorders.** *Cephalalgia* 1999, **19:**211–217.
15. Jensen R, Bendtsen L, Olesen J: **Muscular factors are of importance in tension-type headache.** *Headache* 1998, **38:**10–17.
16. Jensen R: **Pathophysiological mechanisms of tension-type headache: a review of epidemiological and experimental studies.** *Cephalalgia* 1999, **19:**602–621.
17. Bendtsen L, Jensen R, Olesen J: **Qualitatively altered nociception in chronic myofascial pain.** *Pain* 1996, **65:**259–264.
18. Schnieder P, Aull S, Baumgartner C, *et al.*: **Long-term outcome of patients with headache and drug abuse after inpatient withdrawal: 5-year follow-up.** *Cephalalgia* 1996, **16:**481–485.
19. • Katsarava Z, Fritsche G, Muessig M, *et al.*: **Clinical features of withdrawal headache following overuse of triptans and other headache drugs.** *Neurology* 2001, **57:**1694–1698.

An interesting study of the challenging group of patients from specialized headache clinics.

20. Castillio J, Munoz P, Guitera J, Pascual J: **Epidemiology of chronic daily headache in the general population.** *Headache* 1999, **39:**190–196.
21. Pryse-Phillips W, Findlay H, Tugwell P, *et al.*: **A Canadian population survey on the clinical, epidemiologic, and societal impact of migraine and tension-type headache.** *Can J Neurol Sci* 1992, **19:**333–339.
22. •• Schwartz BS, Stewart WF, Simon D, Lipton RB: **Epidemiology of tension-type headache.** *JAMA* 1998, **279:**381–383.

The first American study of the epidemiology of tension-type and the socioeconomic impact. An important mainstay in headache epidemiology.

23. Rasmussen BK: **Epidemiology and socioeconomic impact of headache.** *Cephalalgia* 1999, **19(suppl 25):**20–23.
24. Lavados PM, Tenhamm E: **Epidemiology of tension-type headache in Santiago, Chile: a prevalence study.** *Cephalalgia* 1998, **18:**552–558.
25. Cheung RT: **Prevalence of migraine, tension-type headache, and other headaches in Hong Kong.** *Headache* 2000, **40:**473–479.
26. Waang SJ, Fuh JL, Lu SR, *et al.*: **Chronic daily headaches in Chinese elderly: prevalence, risk factors, and biannual follow-up.** *Neurology* 2000, **54:**314–319.
27. da Costa MZ, Soares CB, Heinisch RH: **Frequency of headache in the medical students of Santa Catarina's Federal University.** *Headache* 2002, **40:**740–744.
28. Pop PH, Gierveld CM, Karis HA, Tiedink HG: **Epidemiological aspects of headache in a workplace setting and the impact on the economic loss.** *Eur J Neurol* 2002, **9:**171–174.
29. Bigal ME, Bigal JM, Betti M, *et al.*: **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:**710–719.
30. Svensson DA, Ekbom K, Larsson B, Waldenlind E: **Lifetime prevalence and characteristics of recurrent primary headaches in a population based samples of Swedish twins.** *Headache* 2002, **42:**754–765.
31. Moerk H, Jensen R: **Prognosis of tension-type headache: a 10-year follow-up study of patients with frequent tension-type headache.** *Cephalalgia* 2000, **20:**434.
32. Langemark M, Oleesen J, Poulsen DL, Bech P: **Clinical characteristics of patients with tension-type headache.** *Headache* 1988, **28:**590–596.
33. Bendtsen L: **Central sensitization in tension-type headache: possible pathophysiological mechanisms.** *Cephalalgia* 2000, **20:**486–508.
34. Bendtsen L: **Sensitization: its role in primary headache.** *Curr Opin Investig Drugs* 2002, **3:**449–453.
35. Ashina M, Lassen LH, Bendtsen L, *et al.*: **Possible mechanisms of action of nitric oxide synthase inhibitors in chronic tension-type headache.** *Brain* 1999, **122:**1629–1635.
36. • Rasmussen BK, Jensen R, Olesen J: **Impact of headache on sickness absence and utilisation of medical services: a Danish population study.** *J Epidemiol Health* 1992, **46:**443–446.

A reference study of the substantial costs of primary headache disorders.

37. • Schwartz BS, Stewart WF, Lipton RB: **Lost workdays and decreased work effectiveness associated with headache in the workplace.** *J Occup Environ Med* 1997, **39:**320–327.

A well-conducted American study with specific focus on work effectiveness in relation to tension-type headache.

38. Lavados PM, Tenhamn E: **Consulting behaviour in migraine and tension-type headache sufferers: a population-based survey in Santiago, Chile.** *Cephalalgia* 2001, **21:**733–737.
39. Forward SP, McGrath PJ, MacKinnon D, *et al.*: **Medication overuse patterns of recurrent headache sufferers: a community study.** *Cephalalgia* 1998, **18:**146–151.
40. Mueller L: **Tension-type headache, the forgotten headache: how to recognize this common but undertreated condition.** *Postgrad Med* 2002, **111:**25–50.