

Rigmor Jensen  
Lars Bendtsen

## Is chronic daily headache a useful diagnosis?

Received: 10 March 2004

Accepted in revised form: 14 April 2004

R. Jensen (✉) • L. Bendtsen  
Danish Headache Center,  
University of Copenhagen,  
Glostrup Hospital,  
DK-2600 Glostrup, Denmark  
e-mail: rigj@glostruphosp.kbhamt.dk

**Abstract** The widely used term chronic daily headache is a common denominator for a chronic headache with a daily occurrence but is not included in the former and in the revised versions of the IHS classification system. We discuss the pros and cons for the use of the term chronic daily headache, and describe some of the problematic aspects in patients with chronic headaches. We find that the term should only be used as an unspecific, clinical working description and never as a final diagnosis due to lack of specificity. Most patients in specialized headache clinics suffer from several different primary and secondary headaches at the same time and deserve a careful characterization

before a rational therapy can be initiated. In particular, it is of utmost importance to identify and treat coexisting medication overuse since such overuse may distort the clinical phenotypic presentation and render various prophylactic strategies ineffective. As the prognosis of medication overuse headache usually is favorable, identification of drug overuse is mandatory. The use of a wastebasket diagnosis such as chronic daily headache may obscure the precise headache diagnosis leading to an unsatisfactory treatment strategy and should therefore be avoided.

**Key words** Chronic daily headache • Migraine • Tension-type headache • Medication overuse headache

### Introduction

In specialised headache clinics, the vast majority of patients present with frequent daily headaches and constitute a major diagnostic and therapeutic problem. Several instruments have been developed to help doctors and their patients, but specific diagnostic tests are still lacking. In the first diagnostic criteria from the International Headache Society (IHS) published in 1988 [1], frequent headaches were separated into specific subtypes, e.g. chronic tension-type headache and chronic cluster

headache, whereas there was no definition of chronic migraine. The classification of frequent headaches is the part of the first IHS classification that has been most discussed, and much effort has been spent with various attempts to improve the diagnostic criteria of frequent headaches [2–6].

In 1994, Silberstein suggested the term chronic daily headache (CDH) to designate headaches lasting 4 hours or more and occurring 15 days or more per month. CDH includes the so-called transformed migraine, chronic tension-type headache, new daily persistent headache, and hemicrania continua [2]. This definition of CDH is broad

and unspecific without implying any possible etiology, just like arterial hypertension is a common broad term irrespective of the underlying cause. The CDH definition proposed by Silberstein et al. [2] has become quite popular, especially in clinical practice, but is not included in the revised version of the IHS classification [7] for several reasons. In the present paper, we discuss the pros and cons for the use of the term chronic daily headache and delineate some of the problematic aspects in patients with chronic headaches.

## Epidemiology

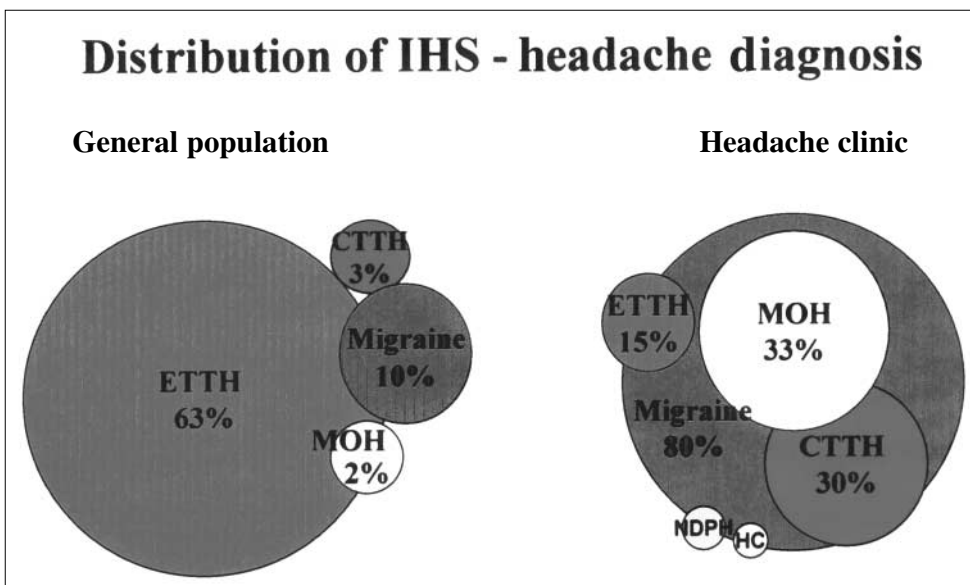
Population-based epidemiological studies of primary headache disorders have reported rather consistent figures for different parts of the world. The last year prevalence is approximately 10%–12% for migraine, 35%–68% for episodic tension-type headache and 4%–5% for chronic daily headache, including 2%–3% with chronic tension-type headache (CTTH) and 1.5%–3% with medication overuse headache (MOH), when the 1988 IHS criteria and the CDH definition by Silberstein et al. [2] are applied [8–12]. However, in clinical studies from specialised headache clinics, the picture is completely different. Here, the prevalence of migraine is 70%–80% and that of chronic daily headache is 30%–40%. Among patients with chronic daily headache, MOH is usually involved in 30%–80%, CTTH in 10%–20% and new persistent daily headache in 1%–2% only (Fig. 1) [13–15].

It is important to be aware of the tremendous selection bias in most clinical reports and the basic scientific rules.

Our scientific ideas and hypotheses are usually generated from the daily clinical work with patients, but to characterize a disease entity it is important to have a broader angle and perspective. The natural history, the nosography and the possible risk factors of the underlying disease can only be described from epidemiological studies and thereafter applied on the patient and not vice versa, as selection bias often distorts the conclusions. Due to the substantial socioeconomic costs and loss of quality of life for our patients with chronic headache, it is our “duty” to approach the problem in an academic and systematic manner.

## Revised version of the IHS classification

The diagnostic criteria of headaches with daily occurrence have been intensely debated. In the second version of IHS classification [7], published in January 2004, attempts to compensate for the previous critique have been made. New diagnostic criteria for a complication to migraine, named chronic migraine, new daily persistent headache and medication overuse headache have been introduced, whereas the diagnostic criteria for chronic tension-type headache are mostly unchanged (Table 1) [7]. So far no comparative studies have been published but the ongoing debate in the field will probably continue as the clinical phenotypic presentation of our patients is still bothersome and complicated. The scientific evidence for the new proposals was rather scarce and they are mainly based on clinical materials from highly specialised tertiary clinics as in the first edition. In clinical studies almost all patients



**Fig. 1** Distribution of the underlying headache diagnosis according to the International Headache Society (IHS), in a general population (*left*) and in a clinical population (*right*). *M*, migraine; *ETTH*, episodic tension-type headache; *CTTH*, chronic tension-type headache; *NDPH*, new daily persistent headache; *HC*, hemicrania continua; *MOH*, medication overuse headache

**Table 1** Common subtypes of chronic daily headache in relation to the diagnostic criteria of the International Headache Society (IHS), second edition [7]. In all the diagnostic groups, the headache should not be attributed to another disorder

IHS-term	Diagnostic criteria
Chronic migraine	1.5.1 A complication of migraine without aura fulfilling the diagnostic criteria for migraine without aura $\geq 15$ days/month for $>3$ months
Chronic tension-type headache	2.3 Headache occurring on ( $\geq 15$ days/month) for $>3$ months and fulfilling the diagnostic criteria for chronic tension-type headache
Hemicrania continua	4.7 Headache for $>3$ months with continuous, unilateral moderate to severe, sidelocked unilateral pain with at least one ipsilateral autonomic feature (conjunctival injection and/or lacrimation, nasal congestion and/or rhinorrhea, ptosis and/or miosis) and with complete response to therapeutic doses of indomethacin
New daily persistent headache	4.8 Headache for $>3$ months, daily and unremitting for less than 3 days from onset with similar characteristics as CTTH
Medication overuse headache	8.2 Headache present on $\geq 15$ days/month and intake of either triptans, ergotamines or opioids on $\geq 10$ days/month or simple analgesics on $\geq 15$ days/month on a regular basis for $\geq 3$ months. Headache frequency markedly increases during medication overuse. Headache reverts to its previous pattern within 2 months after discontinuation

have more than one type of headache. In the recent paper by Bigal et al. [16] in which 638 patients with chronic daily headache were diagnosed according to both the IHS classification and the proposed classification of CDH, these problems were discussed. Almost all patients could be classified by both systems, so the sensitivity was acceptable. According to the IHS system, only 1.6% had one diagnosis, 27.1% had 2 diagnoses and 61.9% had 3 diagnoses, while the remaining subjects had 4 diagnoses or more [16], for a total of up to 14 different diagnoses. None of the 638 CDH patients had migraine as their sole diagnosis and only 1.6% had CTTH as the sole diagnosis. Nevertheless, migraine was found in 90.2% and CTTH in 97.3% of the patients. When the proposed CDH criteria by Silberstein et al. [2] were applied, up to 8 different diagnoses within the same patient were reported [16].

Bigal et al. [16] found it problematic with so many IHS diagnoses within the same patient because it was cumbersome. They suggested a simplification of the diagnostic system, although it can be argued that their data actually demonstrated the opposite, namely that their patients were complex and that they needed a detailed characterization.

Limiting the number of diagnoses should not be a goal in itself. In its extreme, one could suggest that only one diagnosis is used, headache. This would be a simple classification. However, the purpose of a classification system is not to make it as easy as possible for the physician, but to help to improve management of the patients and progress in research. Therefore, we strongly argue against lumping diagnoses together – chronic daily headache may be used as a broad initial clinical description, but it should always be followed by precise diagnoses.

In another series of 630 CDH patients from a Houston migraine clinic [17], 78% of patients had the so-called transformed migraine with mixed features of migraine and tension-type headache (TTH). Furthermore, 73% of all patients used excessive amounts of symptomatic medication on a daily basis [17].

In a recent study from India [11], 849 patients with chronic daily headaches were reported, and 16% had CTTH, 1.5% had new daily persistent headache and 82% were reported to have transformed/chronic migraine. In the latter group, a large proportion had drug overuse and probably also coexisting tension-type headache, although only one headache diagnosis was applied to each individ-

ual. This conflicts with the general IHS classification rules where headaches, not patients, are classified, and where chronic migraine is defined as migraine fulfilling the diagnostic criteria every day 15 days per month or more and where no concurrent medication overuse is accepted. Likewise, a recent population-based French study [12] reported the prevalence of CDH to be 2.98%, but although the authors mentioned that 84.4% of the patients used analgesics or acute migraine medication on a daily basis, they did not discuss the prevalence and considerable risk of medication overuse in this population. Such violations to the IHS classification system are fairly frequent and contribute considerably to the confusion in the area of chronic headache disorders.

In other series, medication overuse headache (MOH) was the diagnosis for 66%–72% of the patients [17–20], most frequently in the subgroup with chronic migraine as in other series with CDH. There are usually only relatively few cases with MOH in the CTTH group [20] and in those with newly persistent headache [18, 20]. These data clearly demonstrate that the diagnosis of chronic migraine without medication overuse is rather infrequent and that a detailed analysis of drug abuse and other coexisting headache disorders is absolutely mandatory in all headache patients with a daily or near daily presentation.

---

### **Pathophysiological mechanisms**

It has been suggested that tension-type headache and migraine share some common biology as they frequently coexist in severely affected patients [3]. Population studies, however, paint a different picture [21, 22]. The latter studies showed that tension-type headache and migraine differ in gender ratio, age distribution, and clinical presentation. Therefore, it could be argued that the “continuum theory” is an artifact of referral bias. It is most likely that migraine and tension-type headache are different disorders. Some traits are shared in migraine and cluster headache, but no headache specialists will claim that migraine and cluster headache are part of a continuum just because both headaches often are unilateral or respond to triptans.

Because episodes of tension-type headache are more pronounced and frequent, although not more prevalent, in subjects with coexisting migraine than in non-migraineurs [21, 22], migraine may be a precipitating factor to tension-type headache in genetically predisposed individuals, and probably also vice versa. Migraine is usually an all or none phenomenon that runs its course once it is activated whether it is once per year or once per week, whereas tension-type headache is a continuum where pain severity and general impact are closely related to frequency. A detailed

genetic characterization of headache patients may help us to improve the clinical description and may probably also lead to an individualized treatment strategy. The most likely explanation for the pathophysiological similarities between migraine and TTH is that activation of the trigeminal system may be of pivotal importance in both disorders. In migraine, activation may predominantly be induced by stimuli from pericranial vessels and brainstem structures, for example, while nociceptive or non-nociceptive stimuli from pericranial tissues may be most important in tension-type headache. Thus, the pain pathways may be shared in the two disorders.

Likewise, central sensitization may play an important role for both primary headaches as it has been suggested that frequent migraine attacks induce a permanent central sensitization in the trigeminal system [23] and as early as 1996 such sensitization has been demonstrated to play a major role in CTTH [24]. As most patients with CTTH started with episodic tension-type headache one or two decades earlier, the process of central sensitization may be a common denominator for both migraine and tension-type headache in their chronic manifestations. The chronic head pain may thereby be a result of repeated pain attacks over a period of years with an initial presentation of either a clear migraine or a clear tension-type headache, a phenotypic shift. The clinical evolution of pain over time has only scarcely been described but is probably a complex combination of genetics, pharmacological and non-pharmacological treatment attempts as well as psychosocial factors [25, 26].

---

### ***Pro a chronic daily headache diagnosis***

In severely affected patients from tertiary pain centers, it can be difficult to give a precise diagnosis at the initial consultation as most patients with daily headaches have symptoms of both migraine and tension-type headache and have some overuse of symptomatic medication at the same time.

Most patients also tend to report their most recent and most severe headache and usually forget the variation in the headache pattern from day to day and their plain drug consumption. Other patients may overestimate the headache frequency and its impact on daily life, not always corresponding to the frequency of their headaches. This discrepancy probably reflects the fact that although a headache may be daily it does not imply that it is a constant headache lasting the entire day. Likewise, a constant daily headache may not always be a severe incapacitating headache but rather a bothersome accompanying irritant that patients more or less get used to and live with for decades.

It can be time consuming and impossible to diagnose patients at the first consultation. Colleagues without specific knowledge of or interest in headache disorders may get confused over the complexity and therefore request a uniform diagnosis as CDH and frequently also a uniform treatment strategy at the first consultation.

Most patients are satisfied with the diagnosis of CDH as they consult the doctor to be reassured that they do not have a brain tumor or similar life-threatening disease and they request a simple and a clear response; that is what chronic daily headache is. Furthermore, the patients usually expect a specific, simple treatment strategy at the first consultation and become disappointed if they are introduced to a diagnostic diary and prospective recordings instead of a specific treatment program.

Is the treatment strategy different whether there is an underlying migraine, a tension-type headache or something else behind the chronic daily headache? Most patients from specialized headache clinics receive one or two different prophylactics and 2–3 different painkillers along with some triptans and only rarely receive other specific medication. The most frequently used headache prophylactics are migraine prophylactics such as beta-blockers, antiepileptics, antidepressants and calcium channel blockers. These drugs have been developed for disorders other than headache and have only been systematically tested in the prophylaxis of migraine and not in other chronic headaches. Although widely used in headache, tricyclic antidepressants have only a documented significant effect in tension-type headache and a modest, if any, effect in migraine [27]. Furthermore, as the headache triggers also are similar and unspecific, most of the non-pharmacological and behavioral prophylactic treatments are unspecific and widely used in CDH patients.

From a practical point of view, both for the patients and the doctors, it is therefore easy and practical to apply a diagnosis of CDH and initiate an unspecific prophylactic treatment strategy.

---

### **Con a chronic daily headache diagnosis**

The first version of the IHS classification [1] aimed to classify headaches, not patients, in order to clarify the clinical characteristics and the underlying pathophysiological mechanisms of the various headaches. The diagnostic criteria have proven effective and are now used worldwide with great success. It is therefore advisable to follow the diagnostic strategy delineated in the IHS classification. It will be a tremendous drawback for scientists, clinicians and patients if old, unspecific terms such as CDH and other unspecific diagnoses become introduced

again. We risk that the recently gained scientific and clinical respect for headache disorders will be lost.

Although some mechanisms may be shared in primary headache disorders, there is a high number of clinical characteristics that differ and until further evidence is presented only clearly delineated patients with either migraine or tension-type headache should be included in pathophysiological and treatment studies. Most patients are actually aware of their different headaches and can clearly describe them and administer the various treatment strategies. Patients also usually seek medical attention for their most bothersome headache, i.e. migraine or cluster headache but tend to underestimate their tension-type headaches at the clinical interview [28], whereas the tension-type headache usually is prominent if they have used a diagnostic diary for some weeks or are interviewed in detail.

The most important problem with the use of a broad diagnostic term such as CDH is the considerable risk of overlooking a medication overuse headache (MOH). A detailed analysis of coexisting drug consumption in all patients with CDH is mandatory since up to 80% of patients from specialized clinics may have MOH [16, 18, 19]. This figure represents a highly underrecognized entity, and this entity will be severely overlooked if the CDH diagnosis gains further acceptance in the medical field. Although it may be difficult to withdraw patients from medication overuse, the prognosis of MOH after detoxification is usually good and the long-term success of withdrawal depends on the type of primary headache and the type of overused medication [29, 30]. It is our duty to identify every headache patient with probable MOH and institute a specific treatment program.

As in other medical specialities, a specific and effective treatment is highly dependent on a specific diagnosis and this is also the case in the treatment of headache. Triptans and ergots should be reserved for migraine and cluster headache whereas no specific treatment for the acute episode of tension-type headache has yet been introduced. Turning to the prophylactics, the migraine-specific prophylactics such as betablockers and antiepileptics have only rarely a reported effect on the coexisting tension-type headache, if measured, and tricyclics which frequently are used for the prophylaxis of chronic tension-type headache have only modest effect on a coexisting migraine [27]. In most clinical trials, the efficacy parameters are usually focused on either migraine or tension-type headache and the additional effects on any eventual coexisting headache are infrequently reported. Only a few clinical trials have been carried out in patients with chronic daily headache and results are usually confusing, probably due to the heterogeneity of the patients, as in clinical trials before the IHS criteria were introduced. The high number of triptan

trials in properly classified and homogenous migraine patients obtained similar results from all over the world, underlining the usefulness and necessity of clearly defined patient groups.

### Diagnostic strategy

The diagnosis of a primary 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 whereas migraine symptoms are more characteristic. A general and neurological examination as well as a prospective follow-up using diagnostic headache diaries with registration of all consumed drugs [28] are therefore of utmost importance to reach the diagnosis. The key problem is thereafter the analysis of the various types of headache within the same subject. General rules for the systematic approach to the headache patient are presented in Table 2. Headaches are usually a dynamic condition and may vary considerably over time, not only between individuals but also within the same person. If all these diagnoses are lumped together in one group, chronic daily headache, valuable information will be lost.

So in conclusion, we find that using a common old diagnostic term such as chronic daily headache will be a considerable drawback. The exciting evolution and enormous progress in genetic and molecular science demands a systematic clinical and scientific approach to these complex patients. It is therefore mandatory to characterize the patients as detailed as possible on the basis of the clinical diversity with several different diagnoses instead of grouping them together in a big wastebasket under the term CDH. It is extremely important to apply a dynamic and an

**Table 2** Useful clinical tools for the physician at the headache interview

- 1) Use a diagnostic diary for at least 4 weeks.
- 2) Record the drug consumption at the first consultation. If it is excessive, initiate detoxification before any other diagnostic workups or treatments are applied.
- 3) Ask the patient: do you have different kinds of headaches? If so, describe them one by one.
- 4) Which headache is the most troublesome?
- 5) Focus the treatment on one headache at a time. Start with the most troublesome.
- 6) Consider any possible secondary causes of headache carefully.
- 7) Perform a detailed general and neurological examination.
- 8) Be realistic and inform the patient about headache mechanisms and of the complexity of headache treatment.
- 9) A severe headache problem can only rarely be solved with medication alone. It is time consuming, and usually requests a good patient-doctor relation as well as a multidimensional treatment approach.

academic approach to the difficult headache patient in the clinic, although it may be time demanding at first glance. Headache patients deserve as careful a scientific and systematic approach as other neurological patients and until a precise diagnostic or genetic test has been developed, we have to rely on patient history and develop further instruments to characterize headache patients on a clinical basis. The effort usually proves to be cost effective as patients are withdrawn from the frequent medication overuse, receive a more specific therapy and demonstrate a better treatment outcome. In pathophysiological research as well as in clinical trials, specific diagnostic groupings have been used for more than a decade and it is time that clinicians follow the general rules and avoid the term CDH, chronic daily headache.

### References

1. – (1988) Classification and diagnostic criteria for headache disorders, cranial neuralgias and facial pain. Headache Classification Committee of the International Society. *Cephalalgia* 8[Suppl 7]:1–98
2. Silberstein SD, Lipton RD, Solomon S, Mathew NT (1994) Classification of daily headaches or near daily headaches: proposed revisions to the IHS criteria. *Headache* 34:1–7
3. Leston JA (1996) Migraine and tension-type headache are not separate disorders. *Cephalalgia* 16:220–223
4. Rasmussen BK (1996) Migraine and tension-type headache are separate disorders. *Cephalalgia* 16:217–220
5. Goadsby P, Boes C (2002) Chronic daily headache. *J Neurol Neurosurg Psychiatry* 72[Suppl 2]:2–5
6. Silberstein SD, Lipton RD, Solomon S, Mathew NT (1996) Classification of daily headaches or near daily headaches: field trial of revised IHS criteria. *Neurology* 47:871–875
7. – (2004) The international classification of headache disorders: 2nd edition. Headache Classification Subcommittee of the International Headache Society *Cephalalgia* 24[Suppl 1]:9–160
8. Rasmussen BK, Jensen R, Schroll M, Olesen J (1991) Epidemiology of headache in a general population - A prevalence study. *J Clin Epidemiol* 44:1147–1157
9. Goebel H, Petersen-Braun M, Soyka D (1994) 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* 14:97–106
10. Castillio J, Murioz P, Guitera V, Pasqual J (1999) Epidemiology of chronic daily headache in the general population. *Headache* 39:190–196

11. Chakravarty A (2003) Chronic daily headache: clinical profile in Indian patients. *Cephalalgia* 23:348–353
12. Lanteri-Minet M, Auray JP et al (2003) Prevalence and description of chronic daily headache in the general population in France. *Pain* 102:143–149
13. Solomon S, Lipton RB, Newman LC (1992) Evaluation of chronic daily headache comparison to chronic tension-type headache. *Cephalalgia* 12:365–368
14. Rapoport AM (1988) Analgesic rebound headache. *Headache* 28:662–665
15. Bigal M, Rapoport AM, Sheftell FD, Tepper ST, Lipton RB (2004) Chronic migraine and medication overuse in a tertiary headache center - clinical characteristics and treatment outcome. *Cephalalgia* (*in press*)
16. Bigal ME, Sheftell FD, Rapoport AM, Lipton RB, Tepper SJ (2002) Chronic daily headache in a tertiary care population: correlation between the International Headache Society diagnostic criteria and proposed revisions of criteria for chronic daily headache. *Cephalalgia* 22:432–438
17. Mathew NT, Stubits E, Nigam MP (1982) Transformation of episodic migraine into daily headache: analysis of factors. *Headache* 22:66–68
18. Toth C (2003) Medications and substances as a cause of headache: a systematic review of the literature. *Clin Neuropharmacol* 26:122–136
19. Diener HC, Dahlfhof CGH (2000) Headache associated with chronic use of substances. In: Olesen, Tfelt-Hansen, Welch (eds) *The headaches*. Lippincott Williams Wilkins, Philadelphia, pp 871–877
20. Katsarava Z, Fritsche G, Muessig M, Diener HC, Limmroth V (2001) Clinical features of withdrawal headache following overuse of triptans and other headache drugs. *Neurology* 57:1694–1698
21. Ulrich V, Russell MB, Jensen R, Olesen J (1996) A comparison of tension-type headache in migraineurs and in non-migraineurs: a population-based study. *Pain* 67:501–506
22. Rasmussen BK, Jensen R, Schroll M, Olesen J (1992) Interrelations between migraine and tension-type headache in the general population. *Arch Neurol* 49:914–918
23. Burstein R, Yarnitsky D, Goor-Aryeh I, Ransil BJ, Bajwa ZH (2000) An association between migraine and cutaneous allodynia. *Ann Neurol* 47:614–624
24. Bendtsen L, Jensen R, Olesen J (1996) Qualitatively altered nociception in chronic myofascial pain. *Pain* 65:259–264
25. Jensen R (1999) Pathophysiological mechanisms of tension-type headache. A review of epidemiological and experimental studies. *Cephalalgia* 19:602–621
26. Scher AI, Stewart WF, Ricci JA, Lipton RB (2003) Factors associated with the onset and remission of chronic daily headache in a population-based study. *Pain* 106:81–89
27. Bendtsen L (2003) Amitriptyline in the treatment of primary headaches. *Exp Rev Neurotherap* 3(2):165–173
28. Russell MB, Rasmussen BK, Brennum J, Iversen H, Jensen R, Olesen J (1992) Presentation of a new instrument. The diagnostic headache diary. *Cephalalgia* 12:369–374
29. Katsarava Z, Limmroth V, Finke M, Diener HC, Fritsche G (2003) Rates and predictors for relapse in medication overuse headache: a 1-year prospective study. *Neurology* 60:1682–1683
30. Schnieder P, Aull S, Baumgartner C, Marterer A, Wöber C, Zeiler K, Wessely P (1996) Long-term outcome of patients with headache and drug abuse after inpatient withdrawal: five year follow-up. *Cephalalgia* 16:481–485