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Frequency and clinical characteristics of chronic daily headache in an outpatient clinic setting

Przewlekły codzienny ból głowy wśród pacjentów poradni bólów głowy: częstość występowania i obraz kliniczny

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Abstract

Background and purpose: Chronic daily headache (CDH) is not a diagnosis but a category that includes many disorders representing primary and secondary headaches. According to the International Classification of Headache Disorders, 2nd edition (ICHD-II), CDH is defined as headache which occurs more often than 15 days per month for at least 3 months.
Material and methods: We assessed 1154 headache sufferers diagnosed in our headache outpatient clinic. Clinical history, physical and neurological examination, and laboratory tests were performed to make a diagnosis.
Results: CDH was diagnosed according to ICHD-II in 185 (16%) patients; their mean age was 41±17 years (80% were women). Chronic migraine was a cause of CDH in 49% (91/185) of patients, chronic tension-type headache in 18% (33/185), secondary headache in 25% (46/185) and unclassified pain in 8%. Medication overuse headache occurred in 15%. The most effective therapy in our patients was treatment with tricyclic antidepressants and selective serotonin reuptake inhibitors.
Conclusions: The most frequent cause of CDH in our cohort was chronic migraine. Women suffered more frequently than men. Antidepressants were the most effective preventive medications for all types of CDH, which may suggest that serotoninergic mechanisms can be an important factor in the pathophysiology of chronic pain syndromes.

Streszczenie

Wstęp i cel pracy: Codzienny przewlekły ból głowy (*chronic daily headache* – CDH) nie jest jednostką chorobową, ale niejednorodną grupą bólów różnego pochodzenia, której wspólny mianownik stanowi codzienne występowanie bólu głowy. Zgodnie z kryteriami Międzynarodowej Klasyfikacji Bólów Głowy Międzynarodowego Towarzystwa Bólu Głowy (wyd. II) codzienny przewlekły ból głowy definiuje się jako ból występujący 15 dni w miesiącu lub częściej przez co najmniej 3 miesiące.
Materiał i metody: Badaniem objęto grupę 1154 pacjentów diagnozowanych i leczonych w poradni bólu głowy. W celu postawienia właściwej diagnozy przeprowadzono badanie podmiotowe, ogólne i neurologiczne pacjentów, testy laboratoryjne oraz badania neuroobrazowe.
Wyniki: Codzienny przewlekły ból głowy rozpoznano u 185 pacjentów (16%) (średnia wieku: 41±17 lat), głównie kobiet (80%). Migrena przewlekła była podłożem CDH u 49% (91/185) chorych, ból głowy typu napięciowego występował u 18% (33/185), bóle wtórne u 25% (46/185), a ból głowy trudny do sklasyfikowania u 8% pacjentów. Polekowy ból głowy stwierdzono u 15% badanych. Najbardziej skutecznym leczeniem okazało się stosowanie trójpierścieniowych leków przeciwdepresyjnych oraz selektywnych inhibitorów wychwytu zwrotnego serotoniny.

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Key words: chronic daily headache, transformed migraine, chronic tension-type headache, medication overuse headache.

Wnioski: Najczęstszą przyczyną przewlekłego bólu głowy jest migrena przewlekła. Wśród pacjentów z CDH przeważają kobiety. Najskuteczniejszą metodą terapii jest leczenie trójpierścieniowymi lekami przeciwdepresyjnymi oraz selektywnymi inhibitorami wychwytu zwrotnego serotoniny, co może wskazywać na istotną rolę ośrodkowego przekaźnictwa serotoninergicznego w patofizjologii bólu przewlekłego.

Słowa kluczowe: przewlekły codzienny ból głowy, migrena transformowana, napięciowy ból głowy, polekowy ból głowy.

Introduction

Chronic daily headache (CDH) was first defined and classified by the International Headache Society (IHS) in 1988 [1], and finally in the second Edition of International Classification of Headache Disorders (ICHD-II) in 2004 [2]. CDH is diagnosed when headache occurs more often than 15 days per month for at least 3 months. After the exclusion of secondary causes, CDH can be divided into two primary groups based on the duration of individual headache episodes [3,4]. The most frequent cause of CDH is primary headache, such as chronic migraine [5,6] and chronic tension-type headache [7-9]. It occurs in 4-5% of the population [10]. Hemicrania continua and cluster headache are less frequent [11-13]. To improve the quality of life of CDH sufferers by decreasing frequency, severity and duration of CDH, prophylactic treatment is used [14-15]. Prophylactic agents for chronic headache include β-blockers, calcium channel blockers, tricyclic antidepressants, selective serotonin reuptake inhibitors (SSRI), serotonin antagonists and antiepileptic drugs. Most patients use only over-the-counter rather than prescription medications for migraine management and finally they suffer because of medication overuse headache [16-20]. Chronic daily headache is the most common type of medication overuse headache. It is classified as transformed migraine and can be defined as perpetuation of maintenance of chronic head pain, caused by the frequent use of immediate relief medications [21-23].

Headache disorders are extremely prevalent and represent a major health problem, which merits increased attention. Daily or almost daily headache significantly decreases quality of life and can even become a cause of depression [24,25]. It is very important, therefore, to educate family physicians, who are the first level for the right diagnosis. A proper interview and general physical examination enable diagnosis and effective treatment.

This study was conducted to define the profile of patients referred to the neurology outpatient clinic for chronic headache, with a view to formulating a management strategy for this common condition.

Material and methods

We assessed 1154 headache sufferers from the Neurology Department's Headache Outpatient Clinic of Warsaw Medical University and, according to the ICHD-II criteria, we diagnosed 185 patients with CDH. The mean age of CDH patients was 41 ± 17 years. Eighty percent (148/185) of CDH patients were women. Clinical history, physical and neurological examination and laboratory tests were performed to make a final diagnosis.

Detailed interview was the basis on which the clinical diagnosis was made. We asked about the duration of the headache, the pattern of attacks – severity and frequency, the location of the pain, the presence or absence of accompanying symptoms and visual, limb or speech disturbances and used medications. The relationship between headache and cough, food, exercise and neck or jaw movements was also enquired about.

A detailed neurological, ophthalmological and general physical examination, including blood pressure measurement, was performed at the first visit. A special diagnostic process, using laboratory tests, electroencephalography and in some cases neuroimaging, was performed. The diagnosis of CDH was finally made based on pattern recognition of a constellation of clinical features. We used prophylactic agents for treatment in our patients – such as β-blockers, calcium channel blockers, tricyclic antidepressants, selective serotonin reuptake inhibitors (SSRI), serotonin antagonists and antiepileptic drugs. The headache days and the severity of the pain before and after treatment were assessed as well.

Statistical calculations were carried out using Student's t-test, χ^2 test, and Cramer V-test, with $p < 0.05$ used as the threshold for statistical significance.

Results

According to the ICHD-II criteria we diagnosed CDH in 16% (185/1154) of patients of our outpatient clinic. General features of CDH in our patients are presented in Table 1.

Sixty-seven percent of CDH patients (124/185) experienced daily headaches from the onset. This could be named primary chronic daily headache [26,27]. The remaining 25% of patients (46/185) initially experienced intermittent headaches, which means they had secondary CDH. In 48% (22/46) of them, the most common circumstance of secondary daily headache was head, neck, or back injury, caused by a car accident. The chronic pain was present at the first visit in 94% of patients (174/185). Migraine diagnosed according to the IHS criteria has been shown as the cause of CDH in 49% (91/185) of patients. Tension-type headache (TTH) was diagnosed in 18% (33/185), secondary headache in 25% (46/185) and unclassified pain in 8% (15/185) of patients. Seventy-two percent (66/91) of migrainous patients had a migraine with aura. Women suffered more often than men – among patients diagnosed with chronic headache 80% (148/185) were women and 20% (37/185) were men. In our clinical observation the onset of headache occurred in the second decade of life in 38% (70/185) of women and in 21% (39/185) of men. In our study both migraine and non-migrainous headaches were significantly more common ($p = 0.00045$) during menstruation – in 57% (85/148) of women. The highest incidence was noted during the first few days of menstruation. In 87% (161/185) of our patients headache lasted for at least 5 years. Twenty-two percent (41/185) of them reported the worst headaches on awakening and 58% (107/185) had the worst headaches in the afternoon or evening. In 20% (37/185), they were worst at a variable time of day.

With regard to associated symptoms, the daily headaches were at least twice per week associated with nausea in 32% (59/185) and with vomiting in 8% (15/185) of cases. Pain was unilateral in 36% (67/185)

Table 1. General features of studied patients with chronic daily headache

	All patients with chronic daily headache	Patients with chronic migraine	Patients with chronic tension-type headache	Patients with secondary headache
N (%)	185 (100)	91 (49)	33 (18)	46 (25)
Sex, female/male[a]	148/37	80/11	20/13	31/15
Age, years (mean ± SD)[b]	41 ± 17	47 ± 12	43 ± 9	39 ± 11

SD – standard deviation

[a]p = 0.0038 for the difference between chronic migraine and secondary headache; differences between other groups were non-significant

[b]all differences between groups were non-significant

Table 2. Characteristics of chronic migraine, chronic tension-type headache and secondary headache in 185 patients with chronic daily headache

	All patients with chronic daily headache	Patients with chronic migraine	Patients with chronic tension-type headache	Patients with secondary headache
Headache > 20 days per month *n* (%)	185 (100)	77 (84)	10 (30)	30 (65)
Severity of headache[a]				
mild, *n* (%)	28 (15)	17(19)	7 (21)	20 (43)
moderate, *n* (%)	39 (21)	20 (22)	11 (33)	9 (20)
severe, *n* (%)	118 (64)	54 (59)	15 (46)	17 (37)
Location[b]				
unilateral, *n* (%)	60 (32)	65 (71)	2 (6)	27 (59)
bilateral, *n* (%)	103 (56)	21 (23)	18 (55)	12 (26)
both unilateral and bilateral, *n* (%)	22 (12)	5 (6)	13 (39)	7 (15)

[a]p = 0.0067 for the difference between chronic migraine and secondary headache; differences between other groups were non-significant

[b]p = 0.0000099 for the difference between chronic tension-type headache and secondary headache; differences between other groups were non-significant

of patients, bilateral in 52% (96/185), and in 12% (22/185) was either unilateral or bilateral. The unilateral headaches had fixed lateralization in 87% (161/185). Characteristics of CDH severity and location in our patients are presented in Table 2.

The most common aggravating factors of CDH in our patients were stress/tension, hunger and lack of sleep. Weather, smell, smoke, and light were precipitating factors that differentiated chronic migraine from chronic TTH.

Overall, 95% (176/185) of the patients experienced severe headaches in addition to the daily headaches. Sixty-four percent (119/185) of the patients had severe headaches 10 days per month or less frequently. Also 64% (119/185) of our patients had headache associated with additional symptoms such as nausea, vomiting, buzzing in the ears or vertigo. With regard to associated symptoms, severe headaches were, at least twice per month, associated with nausea in 82% (152/185) and with vomiting in 40% (74/185), as opposed to mild headaches, which were associated with nausea in 30% (56/185) and vomiting in 5% (10/185).

Intensity is the predominant distinguishing feature between migraine and tension-type headache ($p = 0.019$), which was evaluated on a four-level scale (0 – without pain, 1 – mild, 2 – moderate, 3 – severe). In our cohort, symptoms of depression were present in 64% (119/185) of patients and all of them were in a low mood in a specialist psychiatric assessment.

Medication overuse headache was present in 15% of patients (28/185). The most common was the intake of over-the-counter analgesics – non-steroidal anti-inflammatory drugs (NSAIDs) and paracetamol.

The most effective therapy of CDH was preventive treatment with tricyclic antidepressants, in 60% (111/185) of our patients, and SSRIs, in 15% (28/185), which significantly reduced the headache frequency and the severity of the pain.

Discussion

Chronic daily headache is a common disorder worldwide. The frequency of CDH ranges between 0.5% [28] and 5% [5,29]. Primary headache disorder was diagnosed in the majority of our patients similarly to the previous studies [29-35]. These findings and the preponderance of female patients are similar to previous reports [36]. The most common cause of CDH in our study is chronic migraine, as opposed to the previous studies of Rasmussen and Jensen [37], who found chronic TTH as a cause of CDH in 78% of their patients. With regard to the clinical presentation, the predominant differentiating feature between the two types of primary CDH – migraine and tension-type headache – is intensity.

Secondary causes were also frequent, and a circumstance of secondary headache was head, neck, or back injury. Women suffer more often than men [38]. Both migraine and non-migrainous headaches were significantly more common during menstruation in our cohort. In our clinical observation the onset of headache in women occurred in the second decade of life, which is indicative of the importance of the menstrual cycle in the development of headache in women [36,39,40]. We also confirmed in our study that most patients with CDH had a previous episodic form, which is in accordance with a review of literature data published by Diener in 1993 [41].

It is important for both family physicians and specialists to note the patient's complaint carefully, as this is the basis on which the clinical diagnosis can be made [6,42]. It is also important that no single criterion for migraine or TTH is necessary or sufficient for the diagnosis. The diagnosis is always based on a pattern recognition of a constellation of clinical features. Based on the clinical presentation, we concluded that intensity is the predominant distinguishing feature between migraine and tension-type headache. Headache intensity is traditionally divided into three categories, that is, mild, moderate, and severe, depending on the extent to which the headache affects the ability to function. Mild headache does not affect functioning, moderate headache affects this ability but does not necessitate bed rest, while severe headache is incapacitating and requires bed rest. In our study, tension type headache was typically mild and moderate in intensity while migraine headaches tend to be moderate or severe, which has also been suggested in other studies [5,35,36,43]. Most of our patients reported more severe headaches in the afternoon or evening, which is the same as in other clinical observations. Associated symptoms of headache such as nausea, vomiting, photo- and phonophobia were common in our patients. Apart from light and noise, the most common aggravating factors were physical activity, stress or tension, and menstruation. Related to the generally low intensity of the pain, tension-type headache has few, if any, associated symptoms, and when symptoms occurred they were of mild intensity. Aura symptoms – visual, sensory, speech and occasionally motor – were seen in a minority of migraine patients, but were usually diagnostic. Falling

oestrogen levels, either in normal cycles or due to contraceptive pills or hormone replacement therapy, can also trigger migraine [39,40,44,45]. TTH is classified mainly by the absence of migraine-associated features [46] but it has to be underlined that individual patients may have both TTH and migraine. A proper interview and physical examination provided the requisite quantity of information, and a special investigation was useful only for exclusion of specific structural secondary causes of headache.

Neuroimaging in the investigation of chronic isolated headache is controversial. Based on cost-effectiveness studies, routine neuroimaging for chronic isolated headache is unnecessary [47,48]. In the development of CDH, medication intake is considered to play an important role, in particular the intake of analgesics and vasoconstrictors [18,45,46]. Certainly, drug overuse in migraine plays a pivotal role in the transformation from a paroxysmal to a chronic pattern, but probably in some genetically predisposed individuals only [49]. The debate on medication overuse headache was raised when Lance *et al.* [50] and Bowdler and Kilian in 1988 [51] noted that not all patients who chronically used analgesics developed daily headache. The average analgesic intake was significantly high in our patients, which resembles, to some extent, the figures obtained by Mathew *et al.* [22] in their patients with CDH. However, it is about half that reported by Kudrow [52] in his paper on the paradoxical effects of frequent analgesic use on headache. Medication overuse headache has become a real therapeutic problem in patients with CDH. After withdrawal from analgesic and vasoconstrictor medications, headaches may improve for up to 3 months. Often preventive pharmacologic treatment is initiated immediately after the withdrawal. With regard to preventive pharmacologic treatment, a particularly useful combination in patients with chronic severe headaches is that of a tricyclic antidepressant and a beta-blocker [28,53].

Although numerous groups of drugs are used in preventive treatment, including antidepressants, antiepileptic drugs, beta-blockers, muscle relaxants, non-steroidal anti-inflammatory drugs, magnesium with vitamin B_6, herbal medications and even botulinum toxin, the effectiveness of treatment is still unsatisfactory. The psychological impact of CDH is described in very few studies. Psychiatric comorbidity may occur in most CDH sufferers [24]. It becomes a real problem in patients with medication overuse headache. It has to be underlined that significantly higher prevalence of major depressive disorder, panic disorder, social phobia and abuse of analgesics or other substances was found in patients with a history of chronic medication overuse [25,54,55]. Both depressive and anxiety disorders were significantly more frequent in women and in subjects with chronic migraine than those with chronic TTH [54]. Sleep disturbances are common among chronic daily headache sufferers. About 58-71% of patients had sleep disturbances [55].

Epidemiological studies on CDH are important because the condition is not only a problem of patients and clinicians – it also has sociological and economic consequences. Patients with CDH suffer from lack of sleep and daily pain, and – as a result – present depressive symptoms that substantially decrease their quality of life [56].

The problem of CDH is still plagued by difficulties with classifications and definitions despite the introduction of the concept of chronic migraine and a redefinition of medication overuse headache in the new IHS classification.

Conclusions

1. The most frequent cause of CDH in our cohort was chronic migraine.
2. Women suffered more frequently than men.
3. Antidepressants were the most effective preventive medications for all types of CDH, which may suggest that serotoninergic mechanisms can be an important factor in the pathophysiology of chronic pain syndromes.

Disclosure

Authors report no conflict of interest.

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