Chronic Daily Headache

An Evidence-Based and Systematic Approach to a Challenging Problem

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Individuals presenting with chronic daily headache (CDH) are considered among the most difficult and labor-intensive patients in a neurologist's practice. However, when treated successfully, they can be the most rewarding. Successful treatment plans can be life-changing for patients. Unfortunately, due to both patient and physician-related factors, many individuals with CDH lapse from medical care and seek alternative therapies, and some continue spiraling downward, fueled by medication misuse and overuse.

CDH is not a diagnosis but the presence of headache on at least 15 days/month for at least 3 months. Patients with CDH need secondary etiologies excluded through appropriate investigations before establishing treatment programs. Table 1 lists secondary causes of CDH to which the clinician must be alert. Imaging is frequently necessary to exclude secondary causes, and in the majority of cases, MRI is superior to CT because of causes that are often overlooked or not visible on head CT (table 2). In this article, we review primary CDH and discuss evidence-based treatment strategies.

PRIMARY CDH **Short-duration CDH.** Determining the usual duration (greater or less than 4 hours) of individual headache episodes will refine the differential diagnosis in patients with primary CDH. The prototypical short-lasting primary CDH (<4 hours) is chronic cluster headache (CCH), a trigeminal autonomic cephalalgia (TAC) characterized by severe orbital or temporal pain with accompanying cranial autonomic features such as nasal congestion or lacrimation. Cluster headache becomes chronic if attacks occur for more than 1 year with remissions lasting less than 1 month. Other TACs that may mimic CCH include chronic paroxysmal hemicrania (CPH), short-lasting unilateral neuralgiform headaches with conjunctival injection and tearing (SUNCT) syndrome, and short-lasting unilateral neuralgiform headaches with autonomic symptoms but without lacrimation and conjunctival injection (SUNA). These differ in terms of attack duration and frequency, and have different therapeutic options (table 3).

Hypnic headache (HH) occurs usually in the elderly exclusively during sleep. Patients typically awaken with moderately intense and generalized headache without associated symptoms that lasts less than 60 minutes. The headache tends to occur at predictable times each night. In addition to lithium, melatonin, and indomethacin showing benefit, caffeine before bedtime can paradoxically be effective.

Long-duration CDH. Long-duration primary CDH diagnoses include chronic migraine (CM), chronic tension-type headache (CTTH), hemicrania continua (HC), and new daily persistent headache (NDPH). CTTH usually evolves from episodic tension-type headache, and tricyclic antidepressants with cognitive-behavioral measures are first-line treatment options. HC is a continuous side-locked unilateral, moderately severe headache with exacerbations of severe pain lasting hours to days, with cranial autonomic symptoms accompanying exacerbations. By strict diagnostic criteria, patients experience substantial relief after a short therapeutic trial of indomethacin (25–75 mg 3 times a day). NDPH resembles CTTH in that it is typically bilateral, pressing or tightening in quality, mild to moderate in

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"Successful treatment plans can be life-changing for patients"

intensity, and may be associated with no more than one of photophobia, phonophobia, or mild nausea according to International Classification of Headache Disorders (ICHD)–II criteria. However, phenotypes resembling CM are not uncommon. NDPH is an acute constant unremitting headache, developing over less than 3 days. Patients often pinpoint the exact calendar date, often the exact hour, of headache onset. In NPDH, a search for secondary causes is mandatory, given treatment attempts for NDPH are often less successful.

Table 1 Causes of primary and secondary chronic daily headache

Primary chronic daily headaches
Chronic migraine
Chronic tension-type headache
New daily persistent headache
Chronic cluster headache
Chronic paroxysmal hemicrania
Short-lasting unilateral neuralgiform headache with conjunctival injection and tearing
Hypnic headache
Hemicrania continua
Secondary chronic daily headaches
Medication-related
Medication overuse headache
Medication-induced side effects
Posttraumatic
Headache attributable to head injury
Headache attributable to neck injury or whiplash
Disorders of intracranial pressure
Increased intracranial pressure (primary or secondary tumor, idiopathic intracranial hypertension, hydrocephalus)
Decreased intracranial pressure (CSF leak with intracranial hypotension, post-lumbar puncture headache)
Structural
Headache attributable to cervical spine or head/neck myofascial pain disorders
Headache attributable to temporomandibular joint/dental pathology
Cranial neuralgias
Trigeminal neuralgia
Occipital neuralgia
Vascular
Subdural hematoma
Giant cell arteritis
Ischemic or hemorrhagic stroke
Venous sinus thrombosis
Arterial dissection
Severe arterial hypertension
Infectious
Meningitis (tuberculosis, fungal, parasitic)
Sinusitis (sphenoid sinusitis)
Metabolic
Obstructive sleep apnea, hypoxia, hypercarbia, carbon monoxide
Thyroid disease

Table 2 Potential etiologies for headache that are often overlooked on head CT

Vascular disease
Saccular aneurysms
Subarachnoid hemorrhage
Arteriovenous malformations (especially posterior fossa)
Carotid or vertebral artery dissections
Ischemic stroke
Cerebral venous sinus thrombosis
Vasculitis
Reversible cerebral vasoconstriction syndrome
Neoplastic disease
Parenchymal and extra-axial neoplasms (especially in the posterior fossa)
Meningeal carcinomatosis
Pituitary tumor and hemorrhage
Metastatic brain tumors
Cervicomedullary lesions
Chiari malformation
Foramen magnum meningioma
Acoustic schwannoma
Infections
Meningoencephalitis
Cerebritis and brain abscess
Other
CSF leak (intracranial hypotension)
Intracranial hypertension
Idiopathic hypertrophic pachymeningitis

Medication overuse headache. Susceptible individuals with preexisting episodic primary headache disorders, particularly migraine and tension-type headache, frequent (>10 days/month), near-daily, or daily use of simple analgesics, combination analgesics (containing caffeine, codeine, or barbiturates), opioids, ergotamine, or triptans can "transform" their headache from episodic to daily. Synonyms for medication overuse headache (MOH) include rebound, drug-induced, or analgesic-dependent headache. According to the 2004 second edition of the ICHD-II, simple analgesics (taken >15 days/month for >3 months), as well as combination analgesics, opioids, ergots, and triptans (taken at least 10 days/month for >3 months), can lead to this phenomenon.[1] MOH includes the following features: 1) headache frequency increases over time; 2) patients often awaken

Table 3 Trigeminal autonomic cephalalgias (short-duration chronic daily headache disorders)

Feature	PH	SUNCT	Cluster
Sex F:M	2:1	1:2	1:3
Attack duration, min, mean	15	1	60
Attack frequency, mean	11	30	1
Preventive treatment of choice	Indomethacin	Lamotrigine	Verapamil

Abbreviation: PH = paroxysmal hemicrania; SUNCT = short-lasting unilateral neuralgiform headache with conjunctival injection and tearing.

early with headache (despite this not being a feature of original headache); 3) a proportion of attacks may become nondescript, losing migrainous or autonomic features, and begin resembling tension-type headache; 4) a lowered threshold for stress or exertion to precipitate headaches is present; 5) escalating doses of analgesics are required; and 6) headaches occur within predictable time frame after analgesic consumption, with reduced efficacy.

Patients with CDH overusing analgesics must discontinue or taper overused drugs because of the risk of tolerance, habituation, and dependence; the potential for renal, hepatic, and gastrointestinal side effects; and the possibility that medication overuse (MO) may prevent optimal outcomes. Treatment begins with headache education, specifically the role of MO in perpetuating daily headache. Comorbid conditions, including depression and anxiety, need to be addressed. Lifestyle changes, including caffeine cessation, improved sleep hygiene, increased exercise, and stress management strategies are important.[2] Setting realistic expectations, including sharing information that the headache may worsen before it improves and that withdrawal symptoms can last 2–10 days, and providing the patient with support and close follow-up are important to successful treatment plans. Simple analgesics, ergots, triptans, and many combination analgesics can be abruptly stopped, whereas opioids and butalbital-containing analgesics should be tapered gradually. Phenobarbital, a long-acting barbiturate alternative, can be substituted and tapered in patients using butalbital; low doses of clonidine can help with withdrawal symptoms in opioid overuse. While appropriate prophylactic medications are being instituted, symptomatic analgesics (nonsteroidal anti-inflammatory drugs, dihydroergotamine, or corticosteroids) in limited doses (≤2 treatment days per week) from drug classes other than those being overused can help alleviate withdrawal symptoms.

Therapeutic goals in MOH are elimination of daily or near-daily acute medication use, restoration of episodic headache pattern, and effective prophylactic and acute treatment establishment. In longstanding daily or continuous headache, it may be unrealistic to expect pain-free interval restoration, and goals become decreasing daily headache intensity, restoring patient's functioning, reducing headache-related disability, improving quality of life, and providing acute treatment strategies for severe headaches.

TREATMENT OPTIONS FOR CHRONIC MIGRAINE AND OTHER CHRONIC DAILY HEADACHE CM is characterized by at least a 3-month history of headaches occurring >15 days/month, meeting criteria for migraine on >8 days/month, in the absence of medication overuse.[1] However, a diagnosis of CM can confidently be made in a patient with >15 headache days per month and a past history of migraine. According to ICHD-II, when CM is associated with MOH, only a diagnosis of probable CM and probable MOH can be made, and only after withdrawal of overused medications and the persistence of headache can a diagnosis of CM be made. Practically, withdrawing acute medications as the only therapeutic intervention is extraordinarily difficult in clinical practice. Acute MO occurs in two-thirds of patients with CM, and the use of prophylactic medications has been shown to be effective without withdrawal of acute medications. The most pragmatic approach is initiating prophylactic therapy while minimizing acute medications to 2 days/week.

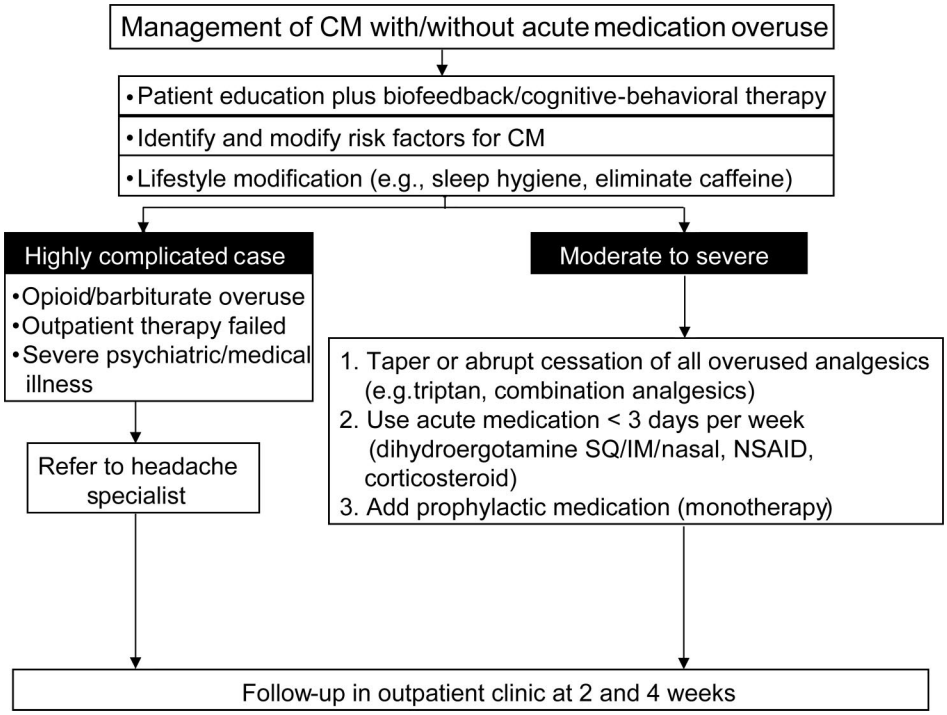
Most with CM have a history of episodic migraine with gradual transition toward more frequent headaches; however, in 30% the transition can be abrupt. Controlled epidemiologic studies have identified attack frequency (>4/month), obesity (body mass index >30), MO, life stressors, snoring/sleep apnea/sleep disturbance, caffeine consumption, female gender, head injury, low education/socioeconomic status, and prior history of episodic migraine as risk factors promoting CM.[3]

Aggressive approaches, involving pharmacologic and nonpharmacologic options, are often required to treat CM (figure). Avoiding identifiable triggers and regulating daily activities to a schedule can help. Addressing risk factors including poor sleep, excessive caffeine intake, lack of exercise, dehydration, and

Chronic Headache

- *Headache at least 15 days per month for at least 3 months*
- *Exclude secondary etiologies: MRI better than CT*
- *Medication overuse headache*
  - *Headaches transformed from episodic to daily*
  - *Simple or combination analgesics, opioids, ergotamine, or triptans*
  - *Risk of tolerance, habituation, and dependence*
  - *Renal, hepatic, and gastrointestinal side effects*

Figure Approach to the patient with chronic migraine (CM), with or without acute medication overuse



NSAID = nonsteroidal anti-inflammatory drug.

anxiety and depression are all nonpharmacologic areas that can aid in successful treatment of CDH. Functional imaging studies have shown anxiety and attention to pain can inhibit central antinociceptive networks. Relaxation training, biofeedback, stress management, and cognitive-behavioral therapy allow patients to exert control over otherwise automatic physiologic responses that influence pain modulation. A recent randomized control trial involving 203 adults with CTTH demonstrated combining tricyclic antidepressants with stress management therapy was more efficacious than either alone.[4] Well-designed trials demonstrated the efficacy of these techniques, and have been given a grade A recommendation from the United States Headache Consortium Guidelines and the American Academy of Neurology Practice Parameter in the management of migraine.[5]

Patients with migraine with frequent, disabling, or refractory headaches, or with contraindications or overuse of acute analgesics, benefit from prophylactic treatment. Drug selection should be based on comorbid conditions, avoiding drugs that may exacerbate another condition. While a number of prophylactic medications have been evaluated for the treatment of primary CDH (table 4), the largest properly conducted placebo-controlled trials in subjects with CM have evaluated efficacy of topiramate and onabotulinumtoxinA.

A small-scale (n = 28) double-blind, placebo-controlled trial demonstrated low-dose topiramate (50 mg/day) may be effective in reducing headache frequency in patients who had CM with MO. Responder rate (≥50% improvement in monthly headache frequency) in topiramate vs placebo-treated subjects was, respectively, 71% and 7%.[6] Two larger, randomized, double-blind, placebo-controlled, parallel-group clinical trials were performed with topiramate in patients with CM. Significant reduction in the mean monthly rate of migraine/migrainous days (6.4 ± 5.8) compared to placebo (4.7 ± 6.1; $p = 0.010$) and a mean reduction from baseline of migraine days per month (5.6 ± 6.0) compared to placebo (4.1 ± 6.1; $p = 0.032$) was observed in the United States,[7] whereas reduction in mean monthly migraine days (−3.5 ± 6.3) was noted compared to placebo (0.2 ± 4.7 $p = 0.02$) in a study conducted in the European Union. In this study, patients with acute MO reported mean monthly reduction in migraine days by 3.5 ± 7.1 days, which was significant compared to placebo with an increase of 0.8 ± 4.8 days ($p = 0.03$). Similar data on MO were unavailable from the US trial, but secondary analysis was performed and showed a trend toward significance ($p = 0.059$). The European trial responder rate of at least 50% reduction of migraine days was significant for topiramate (22% vs 0% $p = 0.012$), but not in the US trial.

Table 4 Summary of evidence for prophylactic medications in undifferentiated chronic daily headache and chronic migraine

Treatment	Evidence for use in CDH and CM
Anticonvulsants	
Topiramate	Double-blind, placebo-controlled trials in CM
Gabapentin	One double-blind, placebo-controlled trial in CDH
Valproate	Small placebo-controlled and comparator trials in CM
Antidepressants	
Amitriptyline	Small open-label trial in TM
Fluoxetine	Small double-blind, placebo-controlled trial in CDH
Tizanidine	Small double-blind, placebo-controlled trial in CDH
Neurotoxins	
OnabotulinumtoxinA	Double-blind, placebo-controlled trials in CM

Abbreviations: CDH = chronic daily headache; CM = chronic migraine; TM = transformed migraine.

Systematic series of exploratory controlled trials failed to show superiority of onabotulinumtoxinA over placebo in subjects with migraine, CDH, and CTTH. Efficacy of onabotulinumtoxinA in episodic migraine and CTTH has therefore not been established.

The PREEMPT clinical program confirmed onabotulinumtoxinA as effective, safe, and well-tolerated prophylaxis for adults with CM. Two phase 3 multicenter studies (PREEMPT 1 and 2) that each had a 24-week, double-blind, parallel-group, placebo-controlled phase followed by a 32-week open-label phase enrolled 1,384 patients with CM.[8,9] All patients received the minimum 155 units IM of onabotulinumtoxinA in 31 sites across 7 head and neck muscles using a fixed-site, fixed-dose injection paradigm. Up to 40 additional units, administered IM to 8 injection sites across 3 head and neck muscles, was allowed using a modified follow-the-pain approach. Pooled analysis demonstrated onabotulinumtoxinA treatment significantly reduced mean frequency of headache days (−8.4 onabotulinumtoxinA, −6.6 placebo; $p < 0.001$) and headache episodes (5.2 onabotulinumtoxinA, −4.9 placebo; $p = 0.009$).[10] Several other efficacy variables (migraine episodes, migraine days, moderate or severe headache days, cumulative hours of headache on headache days, and proportion of patients with severe disability) were significant favoring onabotulinumtoxinA. Results showed significant improvements in multiple headache symptom measures and demonstrated improvement in patient functioning, vitality, psychological distress, and overall quality of life.

Several other drugs have been evaluated for prophylactic treatment of undifferentiated primary CDH, but not specifically CM. However, because these medications have demonstrated efficacy in subjects with episodic migraine and given that CM is a highly disabling disorder with frequently unsatisfactory treatment outcomes, other drug options should be considered.

Gabapentin was evaluated in patients with CDH (dose of 2,400 mg per day).[11] After 12 weeks of treatment, the median 4-week migraine rate was 2.7 (baseline 4.2) in treatment group and 3.5 (baseline 4.1) in placebo group ($p = 0.006$). Additionally, 26 of 56 patients (46.4%) receiving a stable dose of 2,400 mg of gabapentin per day and 5 of 31 patients (16.1%) receiving placebo showed at least a 50% reduction in 4-week migraine rate ($p = 0.008$).

Tizanidine was evaluated in a 134-subject placebo-controlled single-blind study as adjunctive prophylactic treatment for CDH, demonstrating superiority to placebo comparing overall headache index ($p = 0.0025$), mean headache days per week ($p = 0.0193$), severe headache days per week ($p = 0.0211$), average headache intensity ($p = 0.0108$), peak headache intensity ($p = 0.0020$), and mean headache duration ($p = 0.0127$).[12]

Fluoxetine was evaluated in a 64-subject double-blind placebo-controlled trial with CDH (initial doses of 20 mg fluoxetine).[13] Dosages increased up to 40 mg depending on patients' response. After 3 months, fluoxetine subjects had 1.57 fewer headache days per week compared with placebo-treated subjects who had 1.12 headache-free days per week.

Amitriptyline has been shown in clinical studies to be well-tolerated and effective as monotherapy for prevention of migraine and other CDH, most recently in a double-blind, placebo-controlled, 20-week parallel-track study involving 317 subjects which demonstrated superiority of amitriptyline at doses of 50–100 mg at 8 weeks.[14] Amitriptyline is thought to act by facilitating the descending modulation of nociception within the trigeminal nucleus caudalis and spinal dorsal horn by increasing the amount of synaptic amines, enhancing the action of endogenous opiate receptors, and also, in rat models, by inhibiting cortical spreading depression.[15]

One randomized open study in 49 subjects with CM compared sodium valproate 750 mg/day to topiramate 75 mg/day.[16] Three months after randomization, significant reduction in 30-day headache days with respect to baseline ($p < 0.00001$) and significant reduction in Migraine Disability Assessment (MIDAS) scores ($p < 0.00001$) were recorded in both groups. No significant differences in beneficial effects between the 2 medications were shown. Seventy patients with CDH (29 with CM, 41 with CTTH) were studied for efficacy and tolerability of sodium valproate in a prospective, double-blind, randomized, placebo-controlled trial. Sodium valproate and placebo were applied for 3 months to 40 and 30

subjects, respectively. Sodium valproate decreased the maximum pain visual analog score (VAS) for pain levels and pain frequency at the end of the study ($p = 0.028$ and $p = 0.000$, respectively), but did not change general pain VAS levels ($p = 0.198$). In subjects with CM, significant decreases in maximum pain VAS, general pain VAS, and pain frequency parameters were shown in sodium valproate–treated subjects ($p = 0.006$, $p = 0.03$, and $p = 0.001$, respectively).[17] While these studies suggest a role for sodium valproate for treatment of CM, larger randomized controlled trials are required.

Efficacy of prophylactic medication combinations in patients not responding optimally to one medication has not thus far been demonstrated in placebo-controlled trials, though open-label studies and clinical impression have suggested that in selected patients, combination therapy may be effective.

Hospitalization for patients with CM is reserved for those who fail outpatient therapy, overuse significant amount of opioids or butalbital-containing analgesics, and in those with significant medical or psychiatric comorbidity.

DISCUSSION Treatment of CDH, a contributor to significant worldwide morbidity, is difficult and labor-intensive. Treatment is based on diagnosis, exclusion of secondary causes, elimination of MO, and a multidisciplinary team approach addressing risk factors. Treatment is a long process filled with exacerbations and remissions, patient education, healthy patient–physician interactions, and a multidisciplinary team approach. Success in treating CDH is one of the most challenging yet rewarding experiences.

DISCLOSURE

Dr. Halker and Dr. Hastriter report no disclosures. Dr. Dodick serves on scientific advisory boards and as a consultant for Allergan, Inc., Pfizer Inc., Novartis, Merck Serono, NuPath Inc., Nautilus, Coherex Medical, Boston Scientific, Medtronic, Inc., GlaxoSmithKline, CoLucid Pharmaceuticals, Autonomic Technologies, Eli Lilly and Company, Miller Medical, Neuralieve Inc., NeurAxon, Inc., St. Jude Medical, Inc., Zogenix, Inc., CogniMed Inc., MAP Pharmaceuticals, Inc., Lundbeck Inc., IMPAX Laboratories, Inc., and the NIH/NINDS; has received funding for travel or speaker honoraria from CogniMed Inc., Miller Medical, and Annenberg Center for Health Sciences; serves as Editor-in-Chief of *Cephalalgia*, Editor-in-Chief and on the editorial boards of *The Neurologist*, *Lancet Neurology*, and *Postgraduate Medicine*; and has served as Editor-in-Chief of *Headache Currents* and as an Associate Editor of *Headache*; receives publishing royalties for *Wolff's Headache, 8th edition* (Oxford University Press, 2009) and *Handbook of Headache* (Cambridge University Press, 2010); and receives research support from Boston Scientific, Medtronic, Inc., Advanced Neurostimulation Systems, St. Jude Medical, Inc., and the NIH/NINDS.

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REFERENCES

1. Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders, 2nd ed. Cephalalgia 2004; 24(suppl 1):1–160.
2. Dodick DW. Clinical practice: chronic daily headache. N Engl J Med 2006;354:158–165.
3. Bigal ME, Lipton RB. What predicts the change from episodic to chronic migraine? Curr Opin Neurol 2009;22:269–276.
4. Holroyd KA, O'Donnell FJ, Stensland M, Lipchik GL, Cordingley GE, Carlson BW. Management of chronic tension-type headache with tricyclic antidepressant medication, stress management therapy, or their combination: a randomized control trial. JAMA 2001;285:2208–2215.
5. Silberstein SD. Practice parameter: evidence-based guidelines for migraine headache (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology 2000;55: 754–762.
6. Silvestrini M, Bartolini M, Coccia M, et al. Topiramate in the treatment of chronic migraine. Cephalalgia 2003;23: 820–824.
7. Diener HC, Dodick DW, Goadsby PJ, et al. Utility of topiramate for the treatment of patients with chronic migraine in the presence or absence of acute medication overuse. Cephalalgia 2009;29:1021–1027.
8. Aurora SK, Dodick DW, Turkel CC, et al. OnabotulinumtoxinA for treatment of chronic migraine: results from the double-blind, randomized, placebo-controlled phase of the PREEMPT 1 trial. Cephalalgia 2010;30: 793–803.
9. Diener HC, Dodick DW, Aurora SK, et al. OnabotulinumtoxinA for treatment of chronic migraine: Results from the double-blind, randomized, placebo-controlled phase of the PREEMPT 2 trial. Cephalalgia 2010;30:804–814.
10. Dodick DW, Turkel CC, DeGryse RE, et al. OnabotulinumtoxinA for treatment of chronic migraine: pooled results from the double-blind, randomized, placebo-controlled phases of the PREEMPT clinical program. Headache 2010;50:921–936.
11. Spira PJ, Beran RG. Gabapentin the prophylaxis of chronic daily headache: a randomized, placebo-controlled study for the Australian Gabapentin Chronic Daily Headache Group. Neurology 2003;61:1753–1759.
12. Saper JR, Lake AE, Cantrell DT, Winner PK, White JR. Chronic daily headache prophylaxis with tizanidine: a double-blind, placebo-controlled, multicenter outcome study. Headache 2002;42:470–482.
13. Saper JR, Silberstein SD, Lake AE, Winters ME. Double-blind trial of fluoxetine: chronic daily headache and migraine. Headache 1994;34:497–502.
14. Couch JR, for the Amitriptyline vs Placebo Study Group. Amitriptyline in the prophylaxis of migraine and chronic daily headache. Headache Epub 2010 Nov.
15. Krymchantowski AV, Silva MT, Barbosa JS, Alves LA. Amitriptyline versus amitriptyline combined with fluoxetine in the preventative treatment of transformed migraine: a double-blind study. Headache 2002;42: 510–514.
16. Bartolini M, Silvestrini M, Taffi R, et al. Efficacy of topiramate and valproate in chronic migraine. Clin Neuropharmacol 2005;28:277–279.
17. Yurkeli VA, Akhan G, Kutuhan S, Uzar E, Koyuncuoglu HR, Gultekin F. The effect of sodium valproate on chronic daily headache and its subgroups. J Headache Pain 2008;9:3741.

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