Abstract: This article provides background, diagnostic, treatment, and management information about the most common form of headache: tension-type headache (TTH). Using a typical patient case scenario, it illustrates evidence-based therapies that NPs can offer patients whose TTH has become chronic due to medication overuse.

When tension headaches become chronic

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Twenty-four-year-old LS comes to the women's health clinic for oral contraceptives. When the nurse practitioner (NP) asks her if she has any other concerns, she states she has had headaches on and off since her late teens, but her healthcare providers seem unconcerned after hearing the pain usually resolves with over-the-counter (OTC) medications. One provider called them "tension" headaches, which makes LS skeptical about ever finding relief from them. She is under increased stress at work, yet she cannot quit her job. LS has also noticed something different about her headaches. For the past few months, she seems to have a headache of some degree every day and is taking up to six OTC extra-strength pain relievers daily.

Throughout the world, almost half of all adults have an active headache disorder.[1] Without proper diagnosis and treatment, many suffer needlessly, often with an increased risk of renal, hepatic, and gastrointestinal adverse reactions from overuse of analgesics. The purpose of this article is to convey the necessary background, diagnostic, and treatment information about tension-type headaches (TTHs); it also relates a typical patient case scenario, illustrating the evidence-based therapies that NPs can offer patients with TTH that have chronic through medication overuse.

Not just a headache

Classified as TTH by the International Headache Society (IHS), TTH is the most common form of headache; it is also one of the most neglected types because most people with infrequent TTH do not seek medical attention and may self-treat.[2] Its vague characteristics, lack of proper diagnostic criteria, and biological markers have created major obstacles in its research. It was not until 1988 when the IHS introduced TTH as a separate, primary headache disorder and the need for scientific research was finally recognized.[3]

According to the World Health Organization, TTH affects nearly two-thirds of men and more than 80% of women in developed countries, with up to 1 adult in 20 having headaches nearly everyday.[4] TTH may begin in the teen years and reach peak levels in the 30s;[5] it is shown to have a high prevalence in females (up to 59% in those of reproductive age).[6] It is classified into three subtypes according to frequency: infrequent episodic TTH (less than 12 headache days/year), frequent episodic TTH (12 to 180 days/year), and chronic TTH (more than 180 days/year).[7]

Chronic tension-type headache (CTTH) occurs 15 or more days per month.[8] Approximately 3 in 100 adults have CTTH occurring daily or continuously with some variability in pain intensity during a 24-hour cycle.[9] When frequent or chronic, the burden of TTH can be substantial, causing high disability and decreased quality of life. It can also be costly to society due to high prevalence and resulting loss of work/social activity.[2]

Key words: chronic tension-type headache, medication overuse headache, tension-type headache

Photo by George Doyle/Getty Images ©

Patients with TTH experience pain or discomfort in the head, scalp, neck, or shoulders, usually associated with muscle tightness in these areas.[10] TTH can be nothing more than pain in the head; however, to be considered a TTH, patients must describe experiencing at least two of the following:

- pressing or tightening that does not pulsate (vise-like)
- present on both sides of the forehead, temples, or back of the head
- mild-to-moderate degree of pain
- not worsened by physical activity.[11]

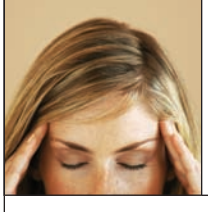
Pathophysiology

The pathophysiology of TTH is not clearly understood. Rather than of vascular origin like migraines, TTH has long been associated with muscular origins such as musculoskeletal problems in the neck.[12] Although firm evidence is lacking, research has indicated that people with TTH have increased pericranial myofascial pain sensitivity, suggesting that peripheral sensitization of myofascial nociceptors plays a role in the increased pain sensitivity.[3] However, pain related to CTTH is believed to be best explained by abnormal pain modulation in the central nervous system.[10]

Although there are no symptoms indicating onset, an aura such as the visual changes, or flashing lights of a migraine, TTH can share similar discomforts from light (photophobia) or sound (phonophobia) but without nausea or vomiting common to migraine (see *Tension-type headache or migraine?*). TTH also has triggers such as stress, poor posture, smoking, fatigue, eye strain, and alcohol use.[5]

Diagnosis

Diagnosis of TTH is based on a detailed patient history, normal physical findings, and neurologic exam—no further testing is necessary.[13] Given the lack of clear pathogenesis, diagnosis of TTH relies on clinical symptoms that are typically less distinct than those of migraines.[2] Secondary headaches (those known to be caused by another disorder) can present as TTH, which adds to the diagnostic challenge, necessitates looking for red flags, and ruling out an underlying condition. For example, accompanying fever, malaise, or weight loss may suggest infection or systemic inflammatory disorder. Patients with headaches for 4 or more weeks or those with a family history of brain tumors, aneurysms, or strong patient or family concerns, should be referred to a neurologist, and brain imaging with a computed tomography (CT) scan or magnetic resonance imaging (MRI) should be considered. Immediate referral to the emergency department with a neurology consult and brain imaging with a CT scan or MRI is necessary for a patient with any of the following signs and symptoms: a "worst ever" headache, unexplained, abnormal neurologic findings, new headache in an older patient, headache that is worsened with Valsalva or induced by exertion, headache with a systemic illness, or a headache that wakes the patient from sleep.[14] (See *SNOOPS: Headache red flags*.) An accurate diagnosis is essential to successful treatment.



Diagnosis of TTH is based on a detailed patient history, normal physical findings, and neurologic exam.

Tension-type headache or migraine?

The following head pain characteristics differentiate TTHs from migraine:

- Non-pulsating pain
- Mild to moderate pain intensity
- Pain is not aggravated by routine activity

SULTANS is a mnemonic that can help with migraine diagnosis:

S Severe
UL UniLateral
T Throbbing
A Activity worsens headache
(Need at least two from this list)
N Nausea
S Sensitivity to light/sound
(Need one from this list)

Developed by Morris Maitzels, MD, Kaiser Permanente, The AAN Headache Encounter Kit.

Diagnosis: Patient scenario

LS checked "headaches" on her medical history form, alerting the NP to obtain more specific information. She requested oral contraceptives, which are contraindicated for women with migraine headaches with aura due to the increased risk of stroke.[15] "Tell me about your headaches," says the NP, in order to elicit information regarding their characteristics, frequency, longevity, relief measures, and any differences compared to prior headaches.

LS describes her headaches as a feeling of pressure that starts near the base of her neck and moves upward; she demonstrates with her hands, pressing them tightly around both sides of her head. Headaches are occurring so frequently she can hardly remember a day when she was totally headache

free. A few months ago, LS purchased extra strength combination headache relievers when her acetaminophen tablets did not dull the pain. She has taken one or two tablets, up to four times a day, nearly every day of the month.

Although LS has no history of migraine headaches, the NP reviews the signs and symptoms of migraine and asks about the presence/severity of nausea or vomiting, photophobia, and phonophobia; whether the pain is aggravated by routine physical activity; and whether there are any signs or symptoms that occurred before the headache started (visual changes). LS indicates that she is sometimes sensitive to sound but has no other signs of migraine.

The NP diagnoses LS with CTTH. According to her history, LS had episodic TTH that transformed to chronic daily headaches from medication overuse. Medication overuse headache (MOH) was formerly called rebound, analgesic-dependent, or drug-induced headache.[16] It is based on the following IHS criteria:

- Headache present for 15 or more days per month
- Regular overuse for more than 3 months of one or more drugs taken for acute or symptomatic treatment (10 or more days per month for ergotamines, serotonin 5-HT_1 receptor agonists (triptans), opioids, or combination analgesics; 15 or more days per month for simple analgesics)
- Headache has developed or markedly worsened during medication overuse
- Headache resolves or reverts to its previous pattern after daily analgesic use is discontinued.[16]

The NP asks LS to use a headache diary for 4 weeks and schedules a follow-up appointment in 2 weeks. Using a monthly calendar, the patient will record the frequency of her headaches, time of day, location and duration of pain, symptoms prior to the headache, triggers, and treatment (medication or sleep and their results). The headache diary can reveal overuse of medication, help distinguish between TTH and mild migraine (which is a common diagnostic problem), and can serve as a baseline against which to measure treatment efficacy.[17] The diary may also reveal headache triggers (lack of sleep) that can be used to guide lifestyle changes, helping to prevent headaches (see *Headache diary*).

SNOOPS: Headache red flags

S	Systemic symptoms (fever, weight loss)
N	Neurologic symptoms or abnormal signs (confusion, impaired alertness)
O	Onset: Sudden, abrupt
O	Older: New onset or progressive headache, especially in patients over age 50
P	Previous headache history: First headache or new or different headache (change in frequency, severity, or clinical features
S	Secondary risk factors (HIV, systemic cancer)

Developed by David Dodick, MD, Mayo Clinic Scottsdale, *The AAN Headache Encounter Kit: Mnemonic Screening Tools. www.aan.com*

Headache diary

Ask the patient to keep a log of his or her headaches to help identify headache frequency, severity, triggers, impact on quality of life, and effectiveness of acute and preventive treatment.

Make keeping a diary as simple as possible. The patient can record the information on a personal or kitchen calendar, on a home computer, smartphone, or a notebook.

The headache diary should contain:

- A record of headache status daily, using a scale from 0 to 3, where 0 is no headache, 1 is mild, 2 is moderate, and 3 is severe.
- Duration of headache
- Relief measures used (such as medication, ice pack, and massage)
- Headache triggers (such as lack of sleep and stressors)
- In women, notation of first day of menses

Adapted from Livingstone I, Novak D. *Breaking the Headache Cycle*. New York, NY: Henry Holt; 2003.

Treatment

MOH is considered a subset of chronic daily headache.[18] The very medication prescribed to address acute headache can cause the progression into a chronic headache condition. As patients use more acute medications, their headaches worsen and usually become more frequent. General evidence is lacking as to whether abrupt or tapering withdrawal treatment is preferable for MOH.[19] However, the European Federation of Neurological Societies (EFNS) headache panel guideline recommends abrupt withdrawal for the overuse of analgesics, ergotamine derivatives, or triptans; tapering down medications for the overuse of opioids, benzodiazepines, or barbituate. Consensus, however, recommends the abrupt withdrawal for the overuse of analgesics.[19,20]

Typically, acute headache improves when medication is discontinued, but this may take days or weeks and can be accompanied by fatigue, nausea, and increased headache. Eventually, the CTTH pattern will revert back to its earlier episodic pattern or remit.[20] Success of withdrawal therapy has been defined as no headache or an improvement of more than 50% in terms of no headache days.[20]

Treatment: Patient scenario

To address the role of medication overuse in CTTH with LS, the NP discusses MOH and how taking daily headache relievers are implicated in perpetuating them; it will be necessary for LS to stop taking all analgesic medications. She is

informed that her headaches may get worse at first and that regular follow-up appointments will be necessary to monitor her clinical course. During the withdrawal phase, simple analgesics (such as the nonsteroidal anti-inflammatory drug, ibuprofen) can be used for acute headache, but it will be limited to no more than twice per week.[21] If headaches decrease in frequency, once withdrawal from medications is complete, MOH can be distinguished from other headache disorders.[20] If improvement does not occur within 2 months, the diagnosis is discarded.[17]

The combination of drug and nondrug therapies such as relaxation or stress management is recommended.

The NP discusses evidence-based preventative therapies such as stress management and cognitive behavioral therapy. The NP also refers LS to the Mindfulness-Based Stress Reduction classes offered by the local medical center. After discussing possible prophylactic pharmacologic treatment such as a tricyclic antidepressant (off-label use for headache) to prevent headaches, LS decides to try nondrug therapies first.

Prevention

History of medication overuse puts patients at risk for future overuse, making daily preventive therapy key to reducing this risk.[22] Pharmacologic and nonpharmacologic preventive strategies should be discussed and tailored to the individual according to patient preference, coexisting conditions, and cost.

There is sufficient evidence to support the use of psychological and behavioral therapies for management of TTH including relaxation training, biofeedback, stress management, and cognitive behavioral techniques.[22] In addition, patients may be guided to avoid triggers identified in their headache diaries. Recommended lifestyle changes that are pertinent to successful treatment of chronic headaches may include regular exercise, stress management, and maintaining regular hours of sleep.

Pharmacologic treatment may also be used to prevent CTTH. In clinical practice, tricyclic antidepressants (off-label use) are used most frequently for prophylaxis; however, few controlled studies support superior efficacy compared to placebo.[2] Typically, a low dose of amitriptyline (10 mg to 25 mg) is initiated at bedtime and may be increased if necessary; an average dose is 50 mg to 75 mg daily.[2] In a recent controlled study that compared amitriptyline to placebo, amitriptyline was well tolerated and effective in preventing chronic daily headache.[23]

Although some healthcare providers might consider using SSRIs rather than tricyclic antidepressants due to adverse reaction concerns, a Cochrane review of 13 randomized controlled studies found that SSRIs were no more effective at preventing TTHs than placebo and less effective than tricyclic antidepressants.[24] However, study results were limited by the short-term (3 months or less) follow-up of patient outcomes.

A combination of pharmacologic and nonpharmacologic therapies has been found to have positive outcomes. Studies show that stress management therapy combined with tricyclic antidepressants (amitriptyline or nortriptyline) was more effective than either behavior therapy or drug therapy alone.[2]

Evidence also supports the use of physical therapies for TTH prophylaxis. A Cochrane review of 11 trials supported the effectiveness of acupuncture to prevent frequent TTHs.[25] Another review of controlled trials looked at the prophylactic effects of noninvasive physical treatments for chronic headaches and found spinal manipulation (practiced by chiropractors or physical therapists) may be effective for preventing TTHs. There was weaker evidence to support a combination of stretching, self-massage, and transcutaneous electrical nerve stimulation (TENS) for preventing TTH; however, all of these therapies had a low risk of adverse reactions.[26]

NPs guide the way

TTH (episodic, chronic, and regardless of cause) is real, causing pain to all and disability to many who experience it. Although acute therapy is effective for episodes of TTH, the evidence supporting preventive treatment for frequent and chronic TTH is limited. The combination of drug therapies and nondrug therapies such as relaxation, stress management, or physical therapies is recommended. While more research is needed to improve management of patients with TTH, NPs face the challenge of helping these patients select evidence-based remediation to find pain relief. NP

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