Diagnosis and Management of Headache in Older Adults

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CME Activity

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Learning Objectives: On completion of this article, you should be able to (1) differentiate between a primary vs a secondary headache disorder in older adults, (2) diagnose and guide treatment for common secondary headache disorders in older adults, and (3) evaluate the risks and benefits of medications used for the treatment of primary headache disorders in older adults.

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Abstract

Headache is a common, disabling neurologic problem in all age groups, including older adults. In older adults, headache is most likely a primary disorder, such as tension-type headache or migraine; however, there is a higher risk of secondary causes, such as giant cell arteritis or intracranial lesions, than in younger adults. Thus, based on the headache history, clinical examination, and presence of headache red flags, a focused diagnostic evaluation is recommended, ranging from blood tests to neuroimaging, depending on the headache characteristics. Regardless of the primary or secondary headache disorder diagnosis, treatment options may be limited in older patients and may need to be tailored to the presence of comorbid medical conditions. The purpose of this review is to provide an update on the management of headache in older adults, from diagnosis to treatment.

 ■ Mayo Clin Proc. 2018;93(2):252-262

Although its prevalence decreases in persons after age 40 years, headache remains a substantial problem for older adults and requires careful consideration of diagnostic and therapeutic options, especially in the setting of other risk factors and comorbid medical conditions.[1,2] In older adults, the prevalence of headache has been reported

TABLE 1. Headache History Red Flags—SNOOP4

S	Systemic symptoms, fevers, chills, myalgias, weight loss
N	Neurologic symptoms, focal
O	Older age at onset, >50 years
O	Onset, thunderclap headache onset
P_1	Papilledema
P_2	Positional
P_3	Precipitated by Valsalva maneuver or exertion
P_4	Progressive headache or substantial pattern change

Data from *Semin Neurol.*[6]

to range from 12% to 50%,[1,3] with frequent headache (more than 2 times per month) occurring in up to 17% of people older than age 65 years.[4] Although headache in older adults is most likely caused by a primary headache disorder, such as tension-type headache (TTH) or migraine, older age increases the risk of a secondary cause of headache.[1,2] For this reason, new-onset headache in older adults requires a methodical review of possible secondary headache disorders and a diagnostic evaluation ranging from blood tests to neuroimaging. In addition, older patients have more comorbid medical conditions, which not only places them at a higher risk of secondary headache but also presents challenges for treatment of primary or secondary headache disorders. Medication overuse, polypharmacy, and altered pharmacokinetics are also concerns for older patients. This review will describe the diagnosis and management of headache in older adults. For this review, *older adult* was defined as a person aged 50 years or older.

SECONDARY HEADACHE

Regardless of a patient's age, the first step in the diagnosis of a new-onset headache is to exclude a secondary headache. A secondary headache is one that is present because of another condition, such as inflammation, intracranial lesions, structural spinal abnormalities, medications, or other medical comorbid conditions. In every patient with a new-onset headache, a detailed clinical history should be obtained, noting headache red flags, and a comprehensive neurologic examination should be performed. This approach is no different in older adults, especially because age is a risk factor for secondary headache disorders. The risk of a worrisome, potentially life-threatening secondary headache is increased 10-fold in those 65 years and older.[1] In a cohort of patients with sudden death who presented with headache, 55% were older than 50 years.[5] Most of the sudden deaths were secondary to vascular events, including aneurysmal rupture, intracranial hemorrhage, and cervical artery dissection. In another series of patients with new-onset headache, 15% of those 65 years or older had a secondary headache compared with 1.6% of patients younger than 65 years.[1] SNOOP4 is a previously published mnemonic for secondary causes of headache.[6] SNOOP4 is applicable for patients of all ages, including those who are older (Table 1),[6] and stands for systemic symptoms; neurologic symptoms; older age at onset of headache; onset of headache attack (eg, a thunderclap headache onset); and papilledema, postural, precipitated by Valsalva maneuver, and progressive headache or substantial pattern change. Depending on the specific red flags, diagnostic testing in older patients will vary but should include blood tests, including erythrocyte sedimentation rate (ESR), and neurovascular imaging to look for a vascular or space-occupying lesion. Table 2 presents secondary headache disorders that are more common in older patients and diagnostic red flags that can be gleaned from the clinical history and examination.

Cerebrovascular Ischemic Event

Age and other vascular risk factors increase the risk of a cerebrovascular ischemic event, and vascular risk factors are more common in older adults. Strokes and transient ischemic attacks (TIAs) result in focal neurologic deficits, such as face, arm, or leg weakness; sensory loss; ataxia; or difficulty with speech or vision. Posterior circulation strokes are more likely to cause headache than anterior circulation strokes.[7] It is important to note that older adults are more likely to have migraine aura without headache,[8,9] which can mimic a TIA; the onset and progression of transient neurologic symptoms are clues to the correct diagnosis. When sudden onset of unilateral arm sensory loss occurs, an ischemic event should be considered, whereas a march or progression of unilateral arm paresthesias,

TABLE 2. Secondary Headache Disorders in Older Adults

Secondary headache disorder	Red flag
Cerebrovascular ischemic event (stroke)	Sudden onset of focal neurologic deficits; headache is more common for strokes in the posterior vs anterior circulation
Intracranial hemorrhage (epidural, subdural, subarachnoid, or parenchymal)	Thunderclap headache, "worst headache of life"; focal neurologic deficits; depressed level of consciousness; presence of anticoagulation
Cerebral neoplasm	Typically, subacute onset of focal neurologic deficits; papilledema
Posttraumatic headache	Head trauma
Giant cell arteritis	Systemic symptoms; scalp tenderness; jaw claudication; visual changes; associated with polymyalgia rheumatica
Cardiac cephalagia	Headache precipitated by exertion
Headache attributable to sleep apnea	Morning headache; history of sleep apnea
Headache attributed to subacute glaucoma	Headache in dimly lit conditions
Cervicogenic headache	Headache exacerbated by neck movement
Medication overuse headache	Polypharmacy

consistent with cortical spreading depression, is more likely migraine aura.[10] However, given the similarity in presentation of these 2 conditions, older patients with these symptoms should be evaluated immediately for a cerebrovascular ischemic event. Emergency medical services should be activated, and patients should undergo the appropriate evaluation for emergent stroke, including neuroimaging and consideration for immediate intervention if indicated.

Thunderclap Headache

A thunderclap headache, which is a severe, sudden-onset headache that reaches peak intensity within 60 seconds, is concerning for intracranial bleeding, including hypertensive parenchymal hemorrhage, or a subdural, subarachnoid, or epidural hematoma. Determining whether an older adult has fallen or has taken an anticoagulant medication is important for diagnosing the cause of thunderclap headache. For any patient with a thunderclap headache, including older patients, emergency medical services should be initiated. Because of the high rate of morbidity and mortality, a subarachnoid hemorrhage and other intracranial bleeding must be ruled out as soon as possible. However, if intracranial bleeding is not present, other causes of a thunderclap headache should be investigated. Other causes of thunderclap headache include reversible cerebral vasoconstriction syndrome, cerebral venous sinus thrombosis, cervical artery dissection, meningitis or encephalitis, and spontaneous intracranial hypotension.[11] All patients with a thunderclap headache must undergo computed tomography (CT) of the head without contrast medium. The head CT should be performed as soon as possible because its sensitivity for detecting a subarachnoid hemorrhage declines with time. If the head CT does not reveal the cause of the thunderclap headache, a lumbar puncture is indicated. A lumbar puncture helps to evaluate a possible subarachnoid hemorrhage or other causes of a thunderclap headache. If both the head CT and lumbar puncture are unrevealing, additional neurovascular head and neck imaging is recommended to rule out other causes of a thunderclap headache.

Giant Cell Arteritis

Giant cell arteritis (GCA) is a systemic vasculitis of medium and large vessels, although it is more predominant in the cranial arteries.[12] A patient's clinical history may include the following headache red flags for GCA: older age at onset, progressive headache, systemic symptoms, and polymyalgia rheumatica. Headache is the most commonly reported symptom of GCA. In one study, headache was reported in 73% of cases and was the presenting symptom in 35% of biopsy-confirmed cases of GCA.[13] The incidence of GCA increases with age and should always be

Mayo Clin Proc. ■ February 2018;93(2):252-262 ■ https://doi.org/10.1016/j.mayocp.2017.12.002
www.mayoclinicproceedings.org

considered for patients older than 50 years with a new-onset headache.[12] Giant cell arteritis is also more common in white women. It can be associated with jaw and tongue claudication, scalp tenderness, polymyalgia rheumatica, and systemic symptoms, including fevers, malaise, and weight loss.[14] Rapid identification, diagnosis, and treatment of GCA can prevent the irreversible complication of blindness attributable to ischemic optic neuropathy.

The 5 primary features of GCA are (1) ESR greater than 50 mm/h, (2) age 50 years or older, (3) new-onset headache, (4) clinical temporal artery abnormality, and (5) abnormalities on temporal artery biopsy. The American College of Rheumatology requires a patient to have 3 of the 5 primary features to meet the diagnostic criteria.[15] A laboratory test for ESR should be done for all patients 50 years and older who have new-onset headache; however, the ESR results may be normal in 11% of GCA cases.[16] For this reason, a C-reactive protein level and complete blood cell count may be helpful and should also be ordered. The C-reactive protein level is a more sensitive marker of inflammation than ESR in GCA, and a complete blood cell count may also show a normochromic anemia and thrombocytosis.[17] A temporal artery biopsy is the criterion standard for diagnosis and should be obtained to confirm the diagnosis in patients with suspected GCA. Once GCA is suspected, corticosteroid treatment should be initiated immediately to prevent ophthalmologic complications, and the biopsy should be obtained within 7 days.[18] Diagnostic confirmation should not delay the initiation of corticosteroids. However, confirming the diagnosis with a temporal artery biopsy is essential because of the risks associated with prolonged corticosteroid use in older patients.

Cardiac Cephalalgia

In older adults, headache precipitated by exertion, especially in patients with vascular risk factors, may be a symptom of cardiac cephalalgia, which is a rare, secondary headache disorder.[19] The headache is a symptom of myocardial ischemia, and it can be the sole manifestation of ischemia.[20] The mean age of patients with cardiac cephalalgia is 62 years.[21] The headache is triggered immediately by exertion and relieved with rest. Besides the immediate trigger of exertion and severe intensity, characteristics of the headache vary. Unlike other headache disorders, cardiac cephalalgia is relieved by nitroglycerin, which is unique because in patients with migraine, nitrite derivatives will trigger a migraine attack. A stress test is diagnostic,[22] and revascularization of coronary vessels resolves cardiac cephalalgia.[21]

Sleep Apnea Headache

A sleep apnea headache, which occurs in about 12% to 18% of patients with sleep apnea,[23] is defined as a morning headache that improves with the diagnosis and treatment of a patient's sleep apnea (*International Classification of Headache Disorders, Third edition*, beta version [*ICHD-3*-beta]). Given that the prevalence of sleep apnea increases with age,[24] older patients with new morning headache should be screened for sleep apnea, and a sleep study should be strongly considered. In observational studies, treatment with continuous positive airway pressure provides headache resolution in 49% to 90% of patients.[25,26]

Headache Attributed to Subacute Glaucoma

Subacute glaucoma should be suspected in older patients who have headache with a duration of less than 4 hours and visual blurring triggered by low-light conditions. The mean age at onset is 60 years.[27] Low light results in mydriasis, which can transiently increase the intraocular pressure and cause headache and visual blurring. Diagnosis can be confirmed with a referral to an ophthalmologist and gonioscopy to measure intraocular pressures. Unrecognized subacute glaucoma can result in optic nerve damage and progressive visual loss. Peripheral iridotomy is an effective treatment for both the intraocular pressure and the headache.[27,28]

Cervicogenic Headache

Cervicogenic headache is defined by the *ICHD-3*-beta as a headache that is caused by a disorder of any component of the cervical spine, with or without neck pain.[19] Because degenerative cervical disk disease increases with age, cervicogenic headache should be more prevalent in older adults. However, the true overall incidence or prevalence of

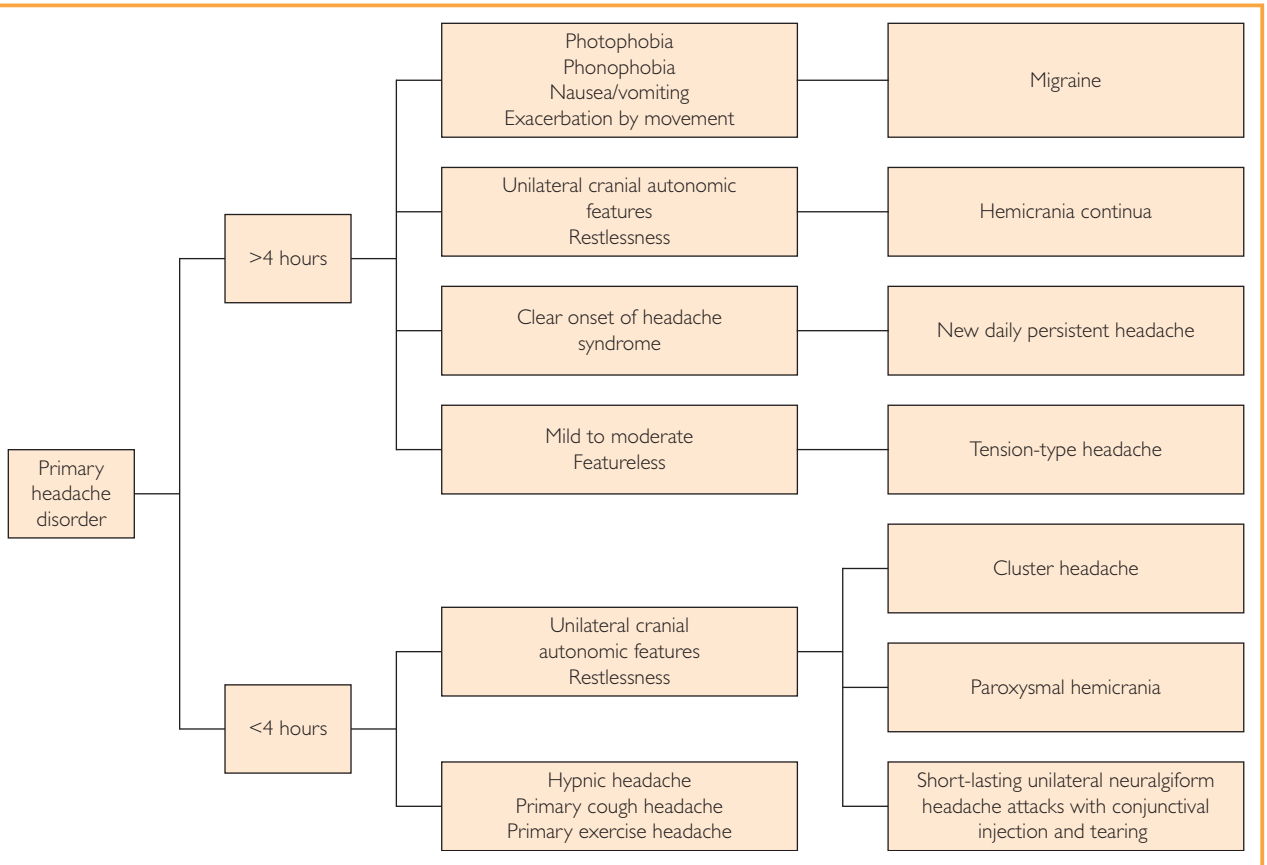

FIGURE. Diagnosis flow chart for primary headache disorder.

cervicogenic headache in patients older than 65 years is unknown because studies that have described the prevalence of the disorder have excluded older patients. If a patient is suspected to have cervicogenic headache, imaging of the spine can identify cervical spine disease. Treatment of cervicogenic headache may be both acute and preventive. Treatment may involve medications, such as nonsteroidal anti-inflammatory drugs (NSAIDs), or procedures, such as occipital nerve blocks or facet injections. However, especially in older patients, safer alternatives are to begin therapy with nonpharmacological treatment options, including physical therapy.

Headache Attributed to the Use of Medications

Medication overuse headache (MOH) is defined by the *ICHD-3*-beta as a headache occurring 15 or more days per month in the setting of an overused medication.[19] Depending on the type of medication, overuse is defined as use more than 10 or 15 days per month.[19] In a large epidemiological study, chronic daily headache (15 or more days per month) occurred in 11.3% of women older than age 60 years.[29] In this series, medication overuse was reported in 19% of patients with chronic TTH and 31% of patients with chronic migraine headaches. Some of the patients in the study had been given analgesic medications for the treatment of pain unrelated to headache, such as back pain, which suggests that for patients with a primary headache disorder, analgesic medications should be prescribed for a limited number of days to avoid the risk of development of MOH. To treat MOH, the medications being overused must be withdrawn.[30]

Many nonanalgesic medications that are commonly prescribed for older patients can also be associated with headache, including nitroglycerin, nifedipine, dipyrimadole, proton

Mayo Clin Proc. ■ February 2018;93(2):252-262 ■ https://doi.org/10.1016/j.mayocp.2017.12.002
www.mayoclinicproceedings.org

pump inhibitors, and selective serotonin reuptake inhibitors.[31,32] New-onset headache as an adverse effect of a recently initiated medication should be considered if a patient's temporal profile is consistent with this possibility. Polypharmacy and altered pharmacokinetics from reduced renal or liver function should also be considered when managing headache in older patients.

PRIMARY HEADACHE

Once a secondary headache has been ruled out, a primary headache disorder should be considered. A diagnosis of a primary headache disorder is based on the headache characteristics including duration, associated features, and frequency. The first step for the diagnosis of primary headache disorders is determining if the headache attacks last more or less than 4 hours (Figure). If longer, the diagnosis may be migraine, TTH, hemicrania continua, or new daily persistent headache, depending on the headache characteristics. If the headache attack is less than 4 hours, the diagnosis may be a trigeminal autonomic cephalalgia, such as cluster headache; hypnic headache; primary cough headache; or primary exercise headache, also depending on headache characteristics. As in younger populations, TTH is the most common primary headache disorder diagnosis in older adults, followed by migraine headache.

Tension-Type Headache

The 1-year prevalence of TTH in older adults ranges from 25% to 35%.[33,34] Despite an overall decline in the incidence of TTH with age, most older patients with new-onset headache will have TTH due to commonly occurring disorders.[2,35] However, although TTH may be common in the population, it is less likely a chief concern among patients in the clinic because of reduced severity, fewer associated symptoms, and minimal associated disability.

The treatment of TTH for older patients is essentially the same as that for younger patients. Depending on the frequency of attacks, both preventive medications and medications for acute attacks may be needed. For prevention, tricyclic antidepressant medications are the best option.[36,37] For patients with cardiac arrhythmias (eg, tachycardia or QT prolongation), tricyclic antidepressants may be contraindicated.[38] When patients are taking a tricyclic antidepressant, they should be monitored with electrocardiography: at baseline, with every dosage adjustment, and at their yearly examination. Tricyclic antidepressants can also cause anticholinergic adverse effects, especially in older adults, including blurred vision, poor cognition, constipation, and urinary retention. Nonsteroidal anti-inflammatory drugs are the first choice for acute or as-needed medication. Nonsteroidal anti-inflammatory drugs should be used cautiously and are contraindicated for patients with renal, gastrointestinal tract, or cardiac disease, depending on the severity of disease.[39-41] Certain NSAIDs may confer a lower risk. For example, nabumetone, meloxicam, and etodolac have a lower risk of gastrointestinal tract bleeding than nonselective NSAIDs.[42] In addition, the attributable risk of NSAIDs for major cardiovascular complications was not identified for naproxen compared with other NSAIDs in a large meta-analysis.[43] However, whenever possible, nonpharmacological options, including biofeedback and relaxation techniques, should be used first to reduce or eliminate the need for pharmacological intervention, to decrease polypharmacy, and to reduce the risk of adverse pharmacological effects or complications.[44]

Migraine

Migraine is the second most common headache disorder after TTH, even in older adults, with a 1-year prevalence of about 10%.[2,45] However, characteristics of migraine change with age. Sensory sensitivities, such as photophobia and phonophobia, decrease as do nausea and vomiting; however, autonomic symptoms, including bilateral tearing and rhinorrhea, can increase.[46,47] Neck pain also increases with attacks.[47]

In addition, the onset of late-life migraine accompaniments or migraine aura without headache is more common in older patients.[8] This aura typically includes visual, sensory, or speech disturbances that can occur independently or in succession and last for less than 60 minutes.[19] Differentiating a migraine aura without headache and a TIA can be very challenging. However, symptoms with a sequential or marching pattern that increase over minutes rather than occur suddenly are more consistent with migraine aura.[8] About 40% to 50%

of these events can also be followed by a typical migraine headache.[8]

The treatment of migraine in older patients requires special consideration because of possible medical comorbid conditions, such as cardiovascular disease, gastrointestinal tract disease, or both; altered pharmacokinetics, such as renal or hepatic impairment; and polypharmacy. Depending on the frequency of migraine attacks, patients may require a preventive regimen in addition to an acute or as-needed treatment option.

Migraine-specific acute treatment options include triptans (serotonin 5-hydroxytryptamine type 1B/1D receptor agonists) and ergotamine derivatives.[48] Triptans are first-line medications for acute attacks in all persons with migraine, even older adults, as long as they are healthy.[49,50] In healthy persons, triptans are not associated with an increased risk of cardiovascular events.[50,51] There are 7 different triptan medications with various routes of administration, including oral tablet, nasal spray, and subcutaneous injection. The nasal spray and injectable formulation are ideal for migraine attacks with rapid onset or severe nausea. However, triptans have vasoconstrictive properties and are contraindicated for patients with substantial cardiovascular and cerebrovascular ischemic disease. Ergotamine derivatives also have vasoconstrictor properties and are contraindicated for patients with ischemic disease. For older patients with migraine, the lack of a migraine-specific acute treatment option without vasoconstrictor properties is problematic given the increase of vascular risk factors with age. A serotonin 5-hydroxytryptamine type 1F receptor agonist has recently demonstrated efficacy in phase 2 clinical trials.[52-54] This upcoming migraine-specific medication, which does not have vasoconstrictive properties, will be ideal for older patients with cardiovascular and cerebrovascular comorbidities.

Other acute treatment options for migraine are nonspecific and include NSAIDs, combination analgesic agents, and opioid and barbiturate medications.[48] Nonsteroidal anti-inflammatory drugs, which do not have vasoconstrictive properties, can be effective for the acute treatment of migraine; however, they may have adverse effects in older patients. Nonsteroidal anti-inflammatory drugs should be used cautiously in elderly patients with comorbid conditions, such as gastrointestinal tract, renal, and cardiovascular disease.[39-41] Combination analgesic, opioid, and barbiturate medications are associated with a high risk for abuse, dependency, medication overuse headache, polypharmacy, and adverse effects.[55,56] These medications should not be used routinely for the acute treatment of migraine in older patients and should be limited to use when other medications are contraindicated. Even then, preventive treatment options should be optimized to reduce use of as-needed medications.[57]

The preventive treatment of migraine serves many roles. The primary goal is to reduce the frequency of migraine attacks; however, preventive treatment also reduces the severity and duration of migraine attacks, and acute medications seem to be more effective with ongoing preventive treatment. Preventive medications may be indicated for a variety of reasons, including high frequency of migraine attacks (1 or more per week), ineffective or contraindicated short-term treatment options, or patient preference. As discussed previously, for older adults, many acute treatment options should be used cautiously or are contraindicated because of comorbid medical conditions. Thus, preventive treatment may be indicated, and many options exist. Evidence-based preventive treatment options for migraine include antidepressant, antiepileptic, and β-blocker medications.[58] Preventive options with level A and B evidence are described in the following paragraphs, including their adverse effects, which are particularly relevant for older patients. No specific preventive treatment option is best suited for older patients. For each patient, the risks and benefits of the various treatment options must be determined. However, the strategy is generally to *start low and go slow*, ie, start with a very low dose of a medication and increase the dose by a small increment every 1 to 2 weeks or as tolerated to reduce the risk of adverse effects or intolerance. In addition, each preventive option should be titrated, optimized, and maximized to its studied goal dose before another medication is added or substituted. Treatment expectations should be managed by educating patients so they understand that medications can take 2 to 3 months at the goal dose to obtain the full benefit. If a treatment option is ineffective, the medication should be discontinued after

Mayo Clin Proc. ■ February 2018;93(2):252-262 ■ https://doi.org/10.1016/j.mayocp.2017.12.002
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the appropriate period of tapering. These strategies can reduce polypharmacy, which is critical for older patients.

Antidepressant medications can be effective for the prevention of migraine. Amitriptyline, a tricyclic antidepressant, has the most evidence (level B) for efficacy, but frequently nortriptyline, a secondary amine, is prescribed because it has fewer adverse effects.[58] These medications could be started at the low dose of 10 mg at bedtime, titrating up by 10 mg every week to a goal dose of 50 to 70 mg at bedtime. Adverse effects of anticholinergic agents include dry eyes, dry mouth, constipation, urinary retention, orthostatic hypotension, weight gain, sedation, or a combination of these effects and can be problematic for all patients, especially older patients. Tricyclic antidepressants can be associated with tachycardia and QT prolongation.[59] As indicated previously, electrocardiography at baseline, when dosage is increased, and at yearly examinations can be used to monitor for arrhythmias in older patients. Venlafaxine, a serotonin-norepinephrine reuptake inhibitor, is another treatment option (level B evidence).[58] Venlafaxine XR can be started at 37.5 mg daily, titrating up by 37.5 mg every week to a goal dose of 150 mg daily. Typically, venlafaxine has fewer adverse effects than tricyclic antidepressants or anticholinergic agents. In addition, venlafaxine can be effective not only for comorbid mood disorders but also for perimenopausal symptoms in older women with migraine.[60]

Antiepileptic medications with a high level of evidence for the prevention of migraine include valproate (level A) and topiramate (level A).[58] Valproate is typically started at 250 mg daily, titrating up by 250 mg every week to a goal dose of 1000 mg daily in 2 divided doses. Periodic laboratory monitoring of blood counts and liver function are recommended. Topiramate can be started at 12.5 mg daily, titrating up by 12.5 mg every week to a goal dose of 100 to 200 mg daily in 2 divided doses. However, both have adverse effect profiles that can be concerning, particularly for older patients. Adverse effects of valproate include weight gain, gastrointestinal tract symptoms, tremor, alopecia, ataxia, sedation, transaminitis, hyperammonemia, and thrombocytopenia. Topiramate, although effective for migraine prevention, can cause cognitive adverse effects, including language deficits, inattention, and poor recall.[61] For older patients, cognitive adverse effects can be very troubling because of the fear of age-related cognitive decline and dementia. Other adverse effects include paresthesias, anorexia, gastrointestinal tract symptoms, sedation, metabolic acidosis, nephrolithiasis, and, rarely, acute-angle glaucoma.

β-Blocker medications (propranolol [level A evidence], metoprolol [level A], and atenolol [level B]) are effective for preventing migraine[58] and can be used for patients with comorbid hypertension and cardiovascular disease, both of which are prevalent in older adults. However, many older patients have sinus bradycardia, a condition that can be worsened by a β-blocker. Other adverse effects include fatigue, exercise intolerance, and hypotension. Bradycardia and hypotension are definite concerns for older patients because of the increased risk of syncope and falls. β-Blockers may also exacerbate comorbid conditions in older patients, including depression, pulmonary disease, and insomnia. They should be used cautiously or may be contraindicated, depending on the severity of the comorbid medical condition.

For prevention of chronic migraine, defined as 15 or more headache days per month with at least half with migraine features,[19] onabotulinumtoxinA injections (155 U every 12 weeks) are effective (level A evidence) and commonly used for older patients.[62] The procedure entails a series of 31 injections in the face, head, and neck. The injections are not associated with systemic adverse effects or drug-drug interactions. They are typically well tolerated in older patients, although some patients have age-related ptosis, which can be worsened with onabotulinumtoxinA injections in the lower third of the frontalis muscle. Therefore, the location and dose of the injections should be altered depending on a patient's baseline ptosis. A potential complication of the injections is neck weakness in the area of the cervical paraspinal muscles; this complication is more prevalent in older adults because of baseline neck weakness and, often, diffuse muscle atrophy. This potential complication can be avoided by slightly adjusting the location of the injections to an area closer to the skull base.

Other frequently used, well-tolerated options with varying levels of evidence can also be prescribed to prevent migraine in older

patients. These medications include angiotensin-converting enzyme inhibitors (eg, lisinopril) and angiotensin receptor blockers (eg, candesartan), which can be prescribed for hypertension and migraine prevention; gabapentin, which is well tolerated and generally does not interact with other medications; melatonin; and memantine, which is well tolerated and typically has no sedative or adverse cognitive effects.[58,63,64]

Nonpharmacological treatment options and evidence-based behavioral interventions, such as biofeedback and cognitive therapy,[44] should always be optimized in patients with migraine and especially for older patients to reduce the use of drugs, which can result in medication overuse, adverse effects, drug-drug interactions, polypharmacy, and altered pharmacokinetics.

Hypnic Headache

Hypnic headache is a primary headache disorder of short duration that occurs in older persons—typically after the age of 50 years. These headaches occur only during sleep and will cause the person to awaken. To meet diagnostic criteria, the headache must occur 15 or more days per month.[19] In addition, secondary causes of headache must be ruled out before diagnosis. Treatment options for hypnic headache include caffeine, melatonin, and lithium.[65] Although effective, lithium may be problematic for older patients because of the possibility for lithium toxicity, altered pharmacokinetics, reduced renal function, drug-drug interactions, and adverse effects that can affect mental status, balance, or both. Fortunately, caffeine, melatonin, or both can be effective for the treatment of hypnic headache, thus avoiding use of lithium altogether.[65,66]

CONCLUSION

The diagnosis and management of headache in older adults differs from that in younger populations. In older adults, there is a higher risk of a secondary headache. Diagnostic evaluations, including neuroimaging and blood tests (at least an ESR) are recommended for older patients with new-onset headache. Adverse medication effects, drug-drug interactions, polypharmacy, and overuse of analgesics are important factors to consider in the management of headache. As with younger adults, TTH and migraine are the most common primary headache disorders in older adults. Nonpharmacological treatment options should always be optimized to prevent polypharmacy and the overuse of medications. Most preventive and acute treatment options for the management of headache can be used for older patients; however, possible adverse effects, altered pharmacokinetics from reduced renal function or liver metabolism, drug-drug interactions, and polypharmacy need to be considered. Triptan medications used for acute migraine attacks are contraindicated in patients with coronary artery disease or a history of cerebrovascular ischemic events, including TIAs. Options for acute attacks are limited for patients with these conditions, although new medications that do not cause vasoconstriction are being tested and may prove to be effective.

For older adults, secondary disorders must always be considered as a possible cause of headache. Once a secondary cause is ruled out, the type of primary headache disorder must be determined. Regardless of the primary or secondary headache disorder diagnosis, treatment options may be limited for older patients and may need to be tailored to the presence of comorbid medical conditions.

Abbreviations and Acronyms: **CT** = computed tomography; **ESR** = erythrocyte sedimentation rate; **GCA** = giant cell arteritis; ***ICHD-3*-beta** = *International Classification of Headache Disorders, Third edition*, beta version; **MOH** = medication overuse headache; **NSAID** = nonsteroidal anti-inflammatory drug; **TIA** = transient ischemic attack; **TTH** = tension-type headache

Potential Competing Interests: Dr Starling is on the advisory board for eNeura Inc; has attended advisory board meetings for Alder BioPharmaceuticals Inc, Amgen Inc, and Eli Lilly and Company; and has consulted for Amgen Inc and Eli Lilly and Company.

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