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Clinical Practice Guideline: Sudden Hearing Loss

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Abstract

Objective. Sudden hearing loss (SHL) is a frightening symptom that often prompts an urgent or emergent visit to a physician. This guideline provides evidence-based recommendations for the diagnosis, management, and follow-up of patients who present with SHL. The guideline primarily focuses on sudden sensorineural hearing loss (SSNHL) in adult patients (aged 18 and older). Prompt recognition and management of SSNHL may improve hearing recovery and patient quality of life (QOL). Sudden sensorineural hearing loss affects 5 to 20 per 100,000 population, with about 4000 new cases per year in the United States. This guideline is intended for all clinicians who diagnose or manage adult patients who present with SHL.

Purpose. The purpose of this guideline is to provide clinicians with evidence-based recommendations in evaluating patients with SHL, with particular emphasis on managing SSNHL. The panel recognized that patients enter the health care system with SHL as a nonspecific, primary complaint. Therefore, the initial recommendations of the guideline deal with efficiently distinguishing SSNHL from other causes of SHL at the time of presentation. By focusing on opportunities for quality improvement, the guideline should improve diagnostic accuracy, facilitate prompt intervention, decrease variations in management, reduce unnecessary tests and imaging procedures, and improve hearing and rehabilitative outcomes for affected patients.

Results. The panel made *strong recommendations* that clinicians should (1) distinguish sensorineural hearing loss from conductive hearing loss in a patient presenting with SHL; (2) educate patients with idiopathic sudden sensorineural hearing loss (ISSNHL) about the natural history of the condition, the benefits and risks of medical interventions, and the limitations of existing evidence regarding efficacy; and (3) counsel patients with incomplete recovery of hearing about the possible benefits of amplification and hearing-assistive technology and other supportive measures. The panel made *recommendations* that clinicians should (1) assess patients with presumptive SSNHL for bilateral SHL, recurrent episodes of SHL, or focal neurologic findings; (2) diagnose presumptive ISSNHL if audiometry confirms a 30-dB hearing loss at 3 consecutive frequencies *and* an underlying condition cannot be identified by history and physical examination; (3) evaluate patients with ISSNHL for retrocochlear pathology by obtaining magnetic resonance imaging, auditory brainstem response, or audiometric follow-up; (4) offer intratympanic steroid perfusion when patients have incomplete recovery from ISSNHL after failure of initial management; and (5) obtain follow-up audiometric evaluation within 6 months of diagnosis for patients with ISSNHL. The panel offered as *options* that clinicians may offer (1) corticosteroids as initial therapy to patients with ISSNHL and (2) hyperbaric oxygen therapy within 3 months of diagnosis of ISSNHL. The panel made a *recommendation against* clinicians routinely prescribing antivirals, thrombolytics, vasodilators, vasoactive substances, or antioxidants to patients with ISSNHL. The panel made *strong recommendations against* clinicians (1) ordering computerized tomography of the head/brain in the initial evaluation of a patient with presumptive SSNHL and (2) obtaining routine laboratory tests in patients with ISSNHL.

Keywords

evidence-based medicine, practice guidelines, sudden hearing loss, sudden sensorineural hearing loss, intratympanic steroids, hyperbaric oxygen

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fees in academic institutions are approximately $600 to $700 per session, including both technical and professional fees. Typical treatments have consisted of 5 to 10 sessions.

Given the small number of patients in the trials reviewed, methodological shortcomings, and poor reporting, the reported findings of benefit should be interpreted cautiously. The substantial cost, the potential adverse effects (including barotrauma), a question of the clinical significance of reported benefits, and the confounding effect of cointerventions (steroids, antivirals, rheologic agents) make it difficult to weigh benefits and harms. The evidence supports possible benefit of HBOT as an adjuvant treatment in cases of acute SSNHL when used within 3 months of the onset of the hearing loss, with potentially more benefit noted in cases of severe to profound loss.

STATEMENT 10. OTHER PHARMACOLOGIC THERAPY: Clinicians should not routinely prescribe antivirals, thrombolytics, vasodilators, vasoactive substances, or antioxidants to patients with ISSNHL. *Recommendation against based on systematic reviews of RCTs with a preponderance of harm over benefit.*

Action Statement Profile for Statement 10

- Aggregate evidence quality: Grade B
- Benefit: Avoidance of unnecessary treatment, avoid adverse events of unnecessary treatment, cost saving
- Risk, harm, cost: None as the recommendation is against the use of these therapies
- Benefit-harm assessment: Preponderance of benefit
- Value judgments: None
- Intentional vagueness: The word *routine* is used to avoid setting a legal standard, recognizing that patient-specific indications for 1 or more of these therapies may be reasonable to try on an individualized basis, with shared decision making
- Role of patient preferences: None
- Exclusions: None
- Policy level: Recommendation against

Supporting Text

The purpose of this statement is to discourage clinicians from using pharmacologic agents that have potential side effects and no documented efficacy, despite the fact that many of these agents are advocated.

One of the proposed etiologies of SSNHL is inflammation caused by a viral infection. Proposed mechanisms of action include direct viral invasion of the cochlea or cochlear nerve, reactivation of a latent virus within the spiral ganglion, and immune-mediated mechanisms once an infection becomes systemic.[178] Theoretically, initiation of antiviral agents may be valuable for aiding in the recovery of hearing. Because direct sampling of inner ear fluids is impractical and potentially harmful to the patient, hematologic serologic testing is the only avenue for viral testing.

Multiple trials have been carried out and failed to find any benefit of the addition of antiviral therapies. Conlin and Parnes performed both a systematic review[7] and meta-analysis[6] of treatments for SSNHL and found only 4 RCTs[179-182] comparing antiviral therapy and steroid therapy vs placebo and steroid therapy. None of the studies reported statistically significant results. In addition, antiviral agent use is not without consequences, and reported side effects include nausea, vomiting, photosensitivity, and, rarely, reversible neurologic reactions, including mental status changes, dizziness, and seizures.

Another proposed etiology of SSNHL is cochlear ischemia. Because the blood supply to the inner ear has no collateral circulation, it is tenuous at best. As with most vascular disorders, hemorrhage, embolism, and vasospasm may affect the inner ear negatively and cause damage, resulting in SSNHL. Fisch et al[183] demonstrated a 30% reduction of perilymphatic oxygen tension in patients with SSNHL and demonstrated that treatment with carbogen resulted in a mean increase in perilymph oxygen tension of 175%. Hypercoagulability has also been seen in blood samples of patients with SSNHL. There is contradictory histopathological and clinical evidence against the vascular theory of SSNHL.[12,184-186] Most patients with SSNHL probably do not have a solely ischemic etiology, which is difficult to disprove based on clinical features and testing.

Vasoactive agents have been tried to enhance cochlear blood flow. Prostaglandin E_1 has shown benefit as a vasodilator and an inhibitor of platelet aggregation. Naftidrofuryl acts to dilate vessels by antagonizing the effect of serotonin and thromboxane A2. Calcium antagonists act to dilate vessels by antagonizing contraction of the smooth muscle cells in the vessel walls. *Ginkgo biloba* extract contains flavones and terpenes, which prevent the development of free radicals in cases of ischemic-related metabolic disturbances and thus counteract secondary vessel contraction. Antihypoxidotic and antiedematous effects, as well as platelet-activating factor (PAF)–antagonistic properties, have been described. Pentoxifylline increases the flexibility of erythrocytes and leukocytes and thus improves blood viscosity, particularly in the capillaries. In addition, pentoxifylline also inhibits platelet aggregation by means of prostaglandin synergy. Dextran may improve microcirculation due to an antithrombotic effect. Hydroxyethyl starch carrier solution reduces the hematocrit level and platelet aggregation.[187,188]

These therapies have considerable side effects. Different types of treatment entail different risks. The clinician should be aware of these potential adverse drug events, including allergic reactions, bleeding, hypotension, arrhythmias, seizures, circulatory collapse, and drug interactions.

The use of vasodilators and vasoactive substances for ISSNHL was reviewed by the Cochrane Collaborative in 2009.[189] Only 3 RCT studies were worthy of evaluation. All 3 of these were considered to have a high risk of bias because their overall methodology was poor and sample sizes were small. The reviewers noted differences in the type, dosage, and duration of vasodilator treatment used in each of these studies. Because of the degree of heterogeneity in methodology and outcomes assessment, the results could not be