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Sensori-neural Hearing Loss and HBO2 Therapy

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One of the most frustrating conditions which appear to otolaryngologists all over the world is the sudden onset of unexplainable sensori-neural hearing loss (ISSNHL). Approximately 4000 cases are reported each year in the United States, with about 15,000 worldwide. Most have no identifiable cause. The natural history is variable and the pathogenesis is multifactorial (1). Despite multiple approaches to therapy, the results of the treatment are not perfect and many patients are left with permanent disabled hearing losses.

Over the past decade there have been numerous reports in the European and Japanese literature demonstrating the efficacy of hyperbaric oxygen therapy (HBO2) as an aid to the recovery of these patients. Treatment of various protocols has led to approximately 60-70% recovery of hearing in these patients. Because of these results some researchers have recommended that HBO2 be initiated in all patients presenting with ISSNHL, especially if they can be seen and treated within the first week after the onset of symptoms (2, 3, 4).

Possible etiologies have been hypothesized, including thrombotic or embolic phenomena, hemorrhage, vasospasm, hypotension, hypertension, dysrhythmias, blood rheologic changes, viral and bacterial infections, immunologic and allergic disorders, metabolic disorders, stress and cochlear window ruptures. In most patients the etiology is unknown even after a thorough investigation. Treatment is empirical (5). Non-HBO2 treatment includes anti-inflammatory drugs, diuretics, anti-virals, vasodilators, volume expanders, defibrinogenators, calcium antagonists, acupuncture, iron replacement, vitamins and procaine (1). The long list of possible etiologies and treatments makes the evaluation of any form of therapy difficult at best. Each proponent of a therapeutic approach presents anecdotal evidence of efficacy. Even prospective studies are difficult to evaluate because each patient presents at a different stage of

disease and biases are hard to eliminate (1).

Mattox and Simmons (6) reported a thorough evaluation of all known forms of medical therapy for ISSNHL and concluded that 65% recover to functional hearing levels spontaneously and independent of any type of medical treatment. Most do so within 14 days and many within the first few days. Linssen and Schultz-Coulen (7) treated patients with naftidofuryl, a vasodilator, and found that patients with a low-frequency ISSNHL had 68.8% complete recovery. Fetterman et al (8) used steroids and vasodilators with 63.6% recovery. Schweinfurth et al (9) stated that nothing works better than spontaneous recovery. Indeed, many patients who recover spontaneously never seek medical care. Patients who have immediate access to medical care (medically related patients) and can be seen and treated in the first few days of onset of symptoms, recovering spontaneously, are then included in the reported good results of any therapy, thus making interpretation of any report suspect.

If vasospasm is considered a possible etiology, HBO2 is a known cerebral vasoconstrictor and actually might be contraindicated in the treatment of ISSNHL. Mattox (10) noted that there is a theoretical concern that high oxygen concentrations might lead to the formation of potentially dangerous oxygen-free radicals in the cochlear and suggests the use of free-radical scavengers.

Until such time that irrefutable scientific evidence supports HBO2 as effective in the treatment of ISSNHL, I would caution hyperbaric physicians, in evaluating results, to strongly consider the role of spontaneous recovery as the basis for their excellent statistics.

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