Hyperbaric Oxygen Therapy for Sudden Sensorineural Hearing Loss in the Only Hearing Ear

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Introduction

Sudden sensorineural hearing loss (SSHL) is an otological emergency. When this occurs in the only hearing ear the consequences for the patient are potentially catastrophic. Steroid treatment constitutes the ‘gold standard’ treatment in practice in the UK however it is not supported by any national guidelines or robust clinical evidence. Hyperbaric oxygen treatment (HBOT) has been shown to potentially improve hearing when treatment is initiated within 2 weeks of symptom onset. HBOT is not routinely funded by the NHS for SSHL but is on does feature on the approved list of indications and can be commissioned on a case-by-case basis.

We present two cases successfully treated with hyperbaric oxygen treatment (HBOT) and combination steroid treatment within 48 hours of presentation according to the algorithm below. In the UK there are no current national guidelines regarding the best treatment for SSHL.

Case 1

27 yo female presented with a sudden deterioration in left sided hearing over the previous 48 hours. She had known profound right SNHL after refractory mucosal otitis media as a child necessitating a right combined approach tympanoplasty and bone anchored hearing aid (BAHA). Pure-tone audiogram (PTA) in 2010 showed an average threshold of 30dB in the left ear and no useable hearing in the right.

Case 2

66 yo male presented with a sudden deterioration in right sided hearing over 72 hours. He had a known left dead ear after surgical resection of a left vestibular schwannoma in 2008. No preceding PTA available. Normal thresholds on the right assumed.

Hyperbaric Oxygen Treatment (HBOT)

Treatments for SSHL have aimed to improve circulation of blood within and the delivery of oxygen to the middle ear. Evaluation of treatments is complicated by the high rate of spontaneous recovery, as much as 65%, within 2 weeks of symptom onset.⁽¹⁾

The hypothesised mechanism of action of HBOT in SSHL is by relieving cochlear ischaemia and oedema after a possible hypoxic event. Auditory cells and peripheral nerve fibres are dependent on oxygen diffusion through perilymph. This is thought to be improved by increasing the circulating arterial oxygen tension.⁽²⁾

Literature regarding the use of HBOT in SSHL is complicated by the differing timing, depth, number of treatments and concurrent or prior medical treatment given. However a Cochrane review has concluded that ‘for people with acute ISSHL, the application of HBOT significantly improved hearing, but the clinical significance remains unclear.’⁽³⁾ Despite this Stobbs et al. have shown that HBOT is used by under 4% of respondents in their UK survey.⁽⁴⁾ In a retrospective cohort study of patients with SSHL treated with HBOT Sherlock et al. showed that 74% of patients had complete or moderate improvement after HBOT. Short delay to HBOT, younger age and severe degree of hearing loss were best predictive factors for improved hearing thresholds.⁽²⁾

We propose this treatment algorithm for patients with SSHL in the only hearing ear as maximal treatment within a limited time frame to maximise potential recovery of hearing and avoidance of further complex audiological or surgical treatment.

References

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