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Systematic Review of Otologic Adverse Events in Hyperbaric Oxygen Therapy

Objectives: Hyperbaric Oxygen (HBO2) Therapy has been associated with some risks and adverse events. Previous studies examining otologic complications from HBO2 therapy vary in their reported incidence of adverse events. This study aims to systematically review the otologic complications associated with HBO2 therapy and investigate contributing risk and protective factors.

Review Methods: A systematic review was conducted to identify studies reporting otologic adverse effects due to HBO2 therapy. Utilizing PRISMA 2020 guidelines, titles and abstracts were screened before conducting a full-text analysis. Studies reporting incidence of otologic complications and studies reporting risk or protective factors for otologic complications were included.

Results: A search for articles on HBO2 therapy otologic complications yielded 2,027 articles, of which 183 were relevant to the research question. Ultimately, 54 studies met the inclusion criteria. Fifteen percent of the 18,284 patients treated with HBO2 therapy experienced adverse events. Of the middle ear barotrauma (MEB) that occurred, 42.8% was mild, and 6.4% was severe. The major risk factors were increasing age, female sex, head and neck pathology, sensory neuropathy, and pre-treatment difficulty equalizing ear pressure. The main protective factor was experience with effective equalization techniques.

Conclusions: 15% of patients experienced otologic complications due to HBO2 therapy. Older age, female sex, and history of head and neck or neurological conditions may increase the risk for MEB. Increased monitoring of higher-risk patients during their initial treatment sessions and proper equalization techniques may protect patients from developing MEB during HBO2 therapy. This is the most comprehensive systematic review on the topic to date.