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Complications and side effects of hyperbaric oxygen therapy

C Plafki ¹, P Peters, M Almeling, W Welslau, R Busch

Affiliations
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Abstract

Background: Despite ongoing controversy, hyperbaric oxygen (HBO) therapy is frequently administered in various clinical situations. Probably because of the unique atmospheric conditions to which the patient is exposed, there are concerns about the safety aspects of this therapy. Possible complications during HBO therapy include barotraumatic lesions (middle ear, nasal sinuses, inner ear, lung, teeth), oxygen toxicity (central nervous system, lung), confinement anxiety, and ocular effects (myopia, cataract growth).

Methods: To analyze the medical safety of HBO therapy, this report reviewed complications and side effects of 782 patients treated for various indications with a total of 11,376 HBO therapy sessions within a multiplace chamber. The absolute treatment pressure was 240 or 250 kPa (114 or 15 msw). The compression was performed in a linear manner with 14 to 15 kPa (1.4 to 1.5 msw) x min(-1). All data were gathered prospectively within a special database.

Results: More than 17% of all patients experienced ear pain or discomfort as an expression of problems in equalizing the middle ear pressure. Most episodes were not related to a persistent eustachian tube dysfunction since they only occurred once. Barotraumatic lesions on visual otological examinations (ear microscopy) were verified in 3.8% of all patients. Patients with sensory deficits involving the ear region need special attention, because they seem to be at risk for rupture of the tympanic membrane (three cases documented). A barotrauma of the nasal sinuses occurred rarely and no barotraumatic lesions of the inner ear, lung, or teeth were noted. Oxygen toxicity of the CNS manifested by generalized seizures affected four patients without any recognizable risk factors or prodromes. None of the patients suffered recurrences or sequelae. Regular checks of the blood glucose in diabetics failed to reveal episodes of hypoglycemia as a cause for seizures. Lung function tests of patients undergoing prolonged treatment (average 52.8 sessions) did not deteriorate.

Conclusion: Patients scheduled for HBO therapy need a careful pre-examination and monitoring. If safety guidelines are strictly followed, HBO therapy is a modality with an acceptable rate of complications. The predominant complication is represented by pressure equalization problems within the middle ear. Serious complications rarely occur.

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