

Hyperbaric Oxygen Therapy for Alzheimer's Disease

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Abstract

Recent studies indicate that hyperbaric oxygen therapy (HBOT), a well-established therapy for decompression illness, could be a potential treatment for Alzheimer's disease (AD). However, due to oxygen toxicity i.e., increased oxidative stress implicated in HBOT, the risk and benefit of HBOT for AD patients need to be further assessed clinically.

Keywords: *Hyperbaric Oxygen Therapy (HBOT); Alzheimer's Disease (AD); Oxidative Stress*

Hyperbaric oxygen therapy (HBOT) involves delivering 100% oxygen to patients in a pressurized chamber at an ambient pressure higher than atmospheric one. It is a well-established therapy for decompression illness. Other medical conditions treated with HBOT include fighting bacteria that causes serious infections; stimulating the release of growth factors and stem cells that promote healing of wounds resulted from diabetes or radiation injury, etc [1].

Interestingly, hyperbaric oxygen and Ginkgo Biloba extract have been claimed to inhibit A β 25-35-induced neurotoxicity, brain oxidative stress, and neuronal apoptosis *in vivo* [2,3]. In rat models, they have also been indicated for ameliorating cognitive and memory impairment via NF κ B pathway [4]; improving cognition and reducing hippocampal damage via p38 mitogen-activated protein (MAP) kinase [5]. More recently, HBOT was shown to be able to reduce pathophysiology of PS1/APP/Tau Alzheimer's disease (3xTg-AD) mouse model by attenuating neuroinflammation [6].

Although, HBOT may seem to be beneficial for AD patients, the results should be interpreted cautiously due to its oxygen toxicity i.e. heightened oxidative stress given that it oxidative stress has already been one of salient neuropathological features in AD [7]. Hence, the potential risk and benefit of HBOT for AD patients warrant further clinical examinations.

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