Aviv Clinics
Brain Performance for Life

Our Research and Findings

HBOT and Post-Concussion Syndrome/TBI

Key Takeaways - Treatment with HBOT can:

- Trigger neuroplasticity, or the brain's ability to adapt in response to injury or disease.
- Induce angiogenesis, the formation of new blood vessels, in the brain.
- Encourage neurogenesis, the development of new neurons in the brain.
- Improve cognitive abilities, including memory, ability to learn new things, concentration and attention, and decision-making.
- **Improve quality of life for adult and pediatric TBI and concussion survivors even years after a brain injury.**

Scientists at the world's largest hyperbaric oxygen facility have conducted numerous studies on the effects of hyperbaric oxygen therapy (HBOT) on the long-term effects of concussions and traumatic brain injuries (TBI) in both adults and children. These researchers, including neurologists, physicians, neuropsychologists, nurses, and hyperbaric medicine specialists, are affiliated with the Sagol Center for Hyperbaric Medicine and Research at the Shamir Medical Center in Israel. In partnership with researchers from Tel Aviv University, they have painstakingly documented and published the results of their research, which has been published in some of the most respected peer-reviewed medical and scientific journals.

Combined, the published research of these teams includes treatment of 260 individuals, as young as eight years old, with varying levels of brain injury. Study patients had suffered concussions or TBIs as many as 33 years prior to treatment, and as recently as just three months before the start of treatment. Research methods included placebo-controlled investigation as well as retrospective analysis of Sagol Center patients' brain scans. HBOT protocols varied, based on the patients' conditions and study parameters, however all received a regimen of up to 70 daily HBOT sessions, each lasting between 60 to 120 minutes, administered for 5 days a week.

Depending on the study, analysis included comparison of pre- and post-treatment cognitive test scores, brain SPECT (single-photon emission computerized tomography) scans, diffusion tensor imaging (DTI), susceptibility contrast enhanced (DSC) perfusion imaging, and quality of life questionnaires.

Adult patients receiving the HBOT treatment protocol showed significant improvement in cognitive function, including memory, attention, executive function, information processing speed, visual-spatial processing, and motor skills. In pediatric patients, significant improvements were seen in general cognitive function, memory, executive function, and emotional function. Quality of life scores also improved significantly post-treatment for all groups.

Comparison of pre- and post-treatment brain scans revealed an increase in cerebral blood flow and volume, as well as improvements in both white and gray microstructures, indicating regeneration of nerve fibers. SPECT imaging revealed elevated brain activity. Brain scans showed the most striking improvements occurred in the regions of the brain that correlated with the cognitive results.

Overall, studies in adults and children supported the assertion that HBOT can stimulate formation of new blood vessels in the brain, induce neuroplasticity and the repair of chronically impaired brain functions in patients with TBI or chronic post-concussion syndrome, even years after the injury occurred.

References:

Hadanny, A., Catalogna, M., Yaniv, S., Stolar, O., Rothstein, L., Shabi, A., Suzin, G., Sasson, E., Lang, E., Finci, S., Polak, N., Fishlev, G., Harpaz, R.T., Adler, M., Goldman, R., Bechor, Y., and Efrati, S. Hyperbaric oxygen therapy in children with post-concussion syndrome improves cognitive and behavioral function: a randomized controlled trial. *Scientific Reports*. Sep. 23, 2022; 12.

Hadanny, A., Abbott, S., Suzin, G., Bechor, Y., and Efrati, S. Effect of hyperbaric oxygen therapy on chronic neurocognitive deficits of post-traumatic brain injury patients: retrospective analysis. *BMJ Open*. Sep. 28, 2018; 8 (9).

Tal, S., Hadanny, A., Sasson, E., Suzin, G., and Efrati, S. Hyperbaric oxygen therapy can induce angiogenesis and regeneration of nerve fibers in traumatic brain injury patients. *Frontiers in Human Neuroscience*. 2017; 11.

Tal, S., Hadanny, A., Berkovitz, N., Sasson, E., Ben-Jacob, E., and Efrati, S. Hyperbaric oxygen may induce angiogenesis in patients suffering from prolonged post-concussion syndrome due to traumatic brain injury. *Restorative Neurology & Neuroscience*. 2015; 33 (6).

Boussi-Gross, R., Golan, H., Fishlev, G., Bechor, Y., Volkov, O., Bergan, J., Friedman, M., Hoofien, D., Shlamkovitch, N., Ben-Jacob, E., and Efrati, S. Hyperbaric oxygen therapy can improve post concussion syndrome years after mild traumatic brain injury – randomized prospective trial. *PLOS ONE*. 2013; 8 (11).

Contact us today to learn if the Aviv Medical Program is right for you or your loved one

888-393-2848
info@aviv-clinics.com
aviv-clinics.com

Read the full research reports on our website.