Hyperbaric oxygen may induce angiogenesis in patients suffering from prolonged post-concussion syndrome due to traumatic brain injury

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Abstract: Purpose: Recent clinical studies present convincing evidence that hyperbaric oxygen therapy (HBOT) may be the coveted neurotherapeutic method for brain repair. One of the most interesting ways in which HBOT can induce neuroplasticity is angiogenesis.The objective in this study was to assess the neurotherapeutic effect of HBOT in post TBI patients using brain perfusion imaging and clinical cognitive functions. Methods: Retrospective analysis of patients suffering from chronic neuro-cognitive impairment from TBI treated with HBOT. The HBOT protocol included 60 daily HBOT sessions, 5 days per week. All patients had pre and post HBOT objective computerized cognitive tests (NeuroTrax) and brain perfusion MRI. Results: Ten post-TBI patients were treated with HBOT with mean of 10.3 ± 3.2 years after their injury. After HBOT, whole-brain perfusion analysis showed significant increased cerebral blood flow and cerebral blood volume Clinically, HBOT induced significant improvement in the global cognitive scores (p=0.007). The most prominent improvements were seen in information processing speed, visual spatial processing and motor skills indices. Conclusion: HBOT may induce cerebral angiogenesis, which improves perfusion to the chronic damages brain tissue even months to years after the injury.

Keywords: Hyperbaric oxygen angiogenesis MRI perfusion cognitive TBI post concussion

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