

C 105

Oral Presentation Time: 1100 - 1112

Poster Presentation Time: 1200 - 1230

President's Competition: NO

HYPERBARIC OXYGEN TREATMENT IMPROVED NEUROPHYSIOLOGICAL PERFORMANCE IN BRAIN TUMOR PATIENTS AFTER NEUROSURGERY AND RADIOTHERAPY

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Introduction/Background: Motor and especially cognitive performance is often permanently impaired in long-term brain tumor survivors after neurosurgery and radiotherapy. Hyperbaric oxygen treatment (HBOT) stimulates neovascularization of hypoperfused tissue that may result in improved functionality of damaged tissue. In this pilot study, clinical neurophysiological tests were used to assess the effect of HBOT on brain performance.

Materials And Methods: Ten long-term brain tumor survivors had HBOT for severe cognitive deficits and some with additional motor impairments after neurosurgery and radiosurgery. Patients were tested before HBOT, and at 6 weeks and 4 months after HBOT. The tests comprised a quantitative electro-encephalographic (EEG) examination, the IQCODE questionnaire for memory performance, and two cognitive tests: number connection test (NCT) and continuous reaction time test (CRTT). Late event-related components (LERCs) of averaged evoked EEG responses to a visual odd-ball stimulus and somatosensory responses were analyzed from whole-head activity maps. For comparison, healthy control subjects (no HBOT) were also investigated.

Results: After HBOT, the amplitude of the LERC with the longest latency, P3b (involved in object interpretation) was significantly improved ($P=.02$). The amplitudes of N200 and the intermediate P3a component, LERCs with shorter latencies, and the visual CI component did not change. Neither latencies nor reaction times changed after HBOT. However, P3a and P3b latencies were longer than in healthy subjects. In patients with motoric complaints, somatosensory responses were improved together with motor performance. The NCT showed inconclusive results, but the IQCODE questionnaire answers showed improvement. When the outcomes of NCT, CRTT, IQCODE and P3b amplitudes are evaluated in common tests, HBOT appears to provide substantial improvement ($P<.006$).

Summary/Conclusions: It is tentatively concluded that HBOT improves neurophysiological performance in long-term brain tumor survivors. Part of this study has been published (Schellart et al., Cancer, Feb 1, 2011, 10.1002/cncr.25874).