

Quantification of Neurocognitive Changes Before, During, and After Hyperbaric Oxygen Therapy in a Case of Fetal Alcohol Syndrome

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ABSTRACT

Fetal alcohol syndrome (FAS) is the most common nonhereditary cause of mental retardation, with deficits in general intellectual functioning, learning, memory, attention, and problem-solving. Presented here is the first case in which measured neurocognitive abilities were determined before, during, and after hyperbaric oxygen therapy in a case of FAS involving a teenage male patient. Memory, reaction time, and visual motor speed assessments were compared. After 40 hyperbaric treatments with 100% oxygen at 1.5 atmospheres absolute, the patient's performance in 6 of 6 categories of the computer-administered test battery improved. Word composite (verbal) scores improved from 55% to 73%, memory composite (visual) scores improved from 38% to 55%, reaction time composites improved from 1.03 to 0.53 seconds, impulse control composite scores improved from 8 to 5, and visual motor speed scores improved from 18.6 to 19.03. The patient's subjective symptoms diminished 94%. Six months after these treatments, the patient's verbal memory was maintained at 73% without any other interventions; impulsivity continued to improve, whereas other indices did not. Thirty-three additional treatments continued to improve test performance, with verbal memory at 95%, visual memory at 57%, and a 100% reduction of subjective symptoms. This patient, with 15-year-matured FAS, benefited from a short course of low-pressure hyperbaric oxygen therapy, sustained durable cognitive improvements, and continued to exhibit improvement with another short course of treatments.