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Hyperbaric Therapy for Children with Autism: a Multicenter, Randomized, Double-Blind, Controlled Trial

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Background:

Several uncontrolled studies of hyperbaric therapy in children with autism have reported clinical improvements; however, this treatment has not been evaluated to date with a controlled study.

Objectives:

We performed a multicenter, randomized, double-blind, controlled trial to assess the efficacy of hyperbaric therapy in children with autism.

Methods:

Sixty-two children with autism, ages 2-7 years (mean 4.92 ± 1.21), were randomly assigned to 40 hourly treatments of either hyperbaric therapy at 1.3 atmosphere (atm) and 24% oxygen ("treatment group", n = 33) or slightly pressurized room air at 1.03 atm and 21% oxygen ("control group", n = 29). Outcome measures included Clinical Global Impression (CGI) scale, Aberrant Behavior Checklist (ABC), and Autism Treatment Evaluation Checklist (ATEC).

Results:

After 40 sessions, mean physician CGI scores significantly improved in the treatment group compared to controls in overall functioning ($p = 0.0008$), receptive language ($p < 0.0001$), social interaction ($p = 0.0473$), and eye contact ($p = 0.0102$); 9/30 children (30%) in the treatment group were rated as "very much improved" or "much improved" compared to 2/26 (8%) of controls ($p = 0.0471$); 24/30 (80%) in the treatment group improved compared to 10/26 (38%) of controls ($p = 0.0024$). Mean parental CGI scores significantly improved in the treatment group compared to controls in overall functioning ($p = 0.0336$), receptive language ($p = 0.0168$), and eye contact ($p = 0.0322$). On the ABC, significant improvements were observed in the treatment group in total score, irritability, stereotypy, hyperactivity, and speech ($p < 0.03$ for each), but not in the control group. In the treatment group compared to the control group: mean changes on the ABC total score and subscales were similar except a greater number of children improved in irritability ($p = 0.0311$); children over age 5 had better ABC improvements in irritability ($p = 0.0149$), social withdrawal ($p = 0.0086$), and stereotypy ($p = 0.0434$); children with lower initial autism severity had better ABC improvements in irritability ($p = 0.0348$) and stereotypy ($p = 0.0359$); and ATEC sensory/cognitive awareness significantly improved ($p = 0.0367$). Hyperbaric therapy was safe and well-tolerated.

Conclusions:

Children with autism treated with hyperbaric therapy at 1.3 atm and 24% oxygen for 40 hourly sessions had significant improvements in overall functioning, receptive language, social interaction, eye contact, and

sensory/cognitive awareness compared to those who received slightly pressurized room air.

Trial registration: clinicaltrials.gov NCT00335790

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