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Hyperbaric Oxygen for Acute Carbon Monoxide Poisoning

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ABSTRACT

Background Patients with acute carbon monoxide poisoning commonly have cognitive sequelae. We conducted a double-blind, randomized trial to evaluate the effect of hyperbaric-oxygen treatment on such cognitive sequelae.

Methods We randomly assigned patients with symptomatic acute carbon monoxide poisoning in equal proportions to three chamber sessions within a 24-hour period, consisting of either three hyperbaric-oxygen treatments or one normobaric-oxygen treatment plus two sessions of exposure to normobaric room air. Oxygen treatments were administered from a high-flow reservoir through a face mask that prevented rebreathing or by endotracheal tube. Neuropsychological tests were administered immediately after chamber sessions 1 and 3, and 2 weeks, 6 weeks, 6 months, and 12 months after enrollment. The primary outcome was cognitive sequelae six weeks after carbon monoxide poisoning.

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Results The trial was stopped after the third of four scheduled interim analyses, at which point there were 76 patients in each group. Cognitive sequelae at six weeks were less frequent in the hyperbaric-oxygen group (19 of 76 [25.0 percent]) than in the normobaric-oxygen group (35 of 76 [46.1 percent], $P=0.007$), even after adjustment for cerebellar dysfunction and for stratification variables (adjusted odds ratio, 0.45 [95 percent confidence interval, 0.22 to 0.92]; $P=0.03$). The presence of cerebellar dysfunction before treatment was associated with the occurrence of cognitive sequelae (odds ratio, 5.71 [95 percent confidence interval, 1.69 to 19.31]; $P=0.005$) and was more frequent in the normobaric-oxygen group (15 percent vs. 4 percent, $P=0.03$). Cognitive sequelae were less frequent in the hyperbaric-oxygen group at 12 months, according to the intention-to-treat analysis ($P=0.04$).

Conclusions Three hyperbaric-oxygen treatments within a 24-hour period appeared to reduce the risk of cognitive sequelae 6 weeks and 12 months after acute carbon monoxide poisoning.

Source Information

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