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Hyperbaric oxygen therapy for acute domestic carbon monoxide poisoning: two randomized controlled trials

Accepted: 1 February 2011
Published online: 25 February 2011
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An author's reply to this comment is available at:
doi:[10.1007/s00134-011-2201-9](https://doi.org/10.1007/s00134-011-2201-9).

Dear Editor,
We read with interest the recent randomized trial of hyperbaric oxygen (HBO) therapy for carbon monoxide (CO) poisoning [1]. This study failed to show a benefit of HBO in mildly ill patients and was terminated prematurely in severely ill patients because of the apparent harm of HBO therapy. We believe that these conclusions are unwarranted because of a critical methodological flaw in the current study.

Carbon monoxide-induced neurological injury most likely results from lipid peroxidation, which is mediated by the migration of inflammatory cells into the CNS [2]. Critical to this process is the ability of neutrophils to adhere to the CNS microvasculature in the areas of inflammation following CO poisoning. Beta-2 integrins on the cell surfaces of neutrophils enable this adherence and can be blocked experimentally at 2.5 or 3.0 atmospheres absolute (ATA), but not at 2.0 ATA [3]. Thus, by using only 2.0 ATA, the current trial could have been predicted to fail. Annane's results stand in clear distinction to the previous randomized trial that demonstrated a benefit of HBO therapy at 3.0 ATA [4]. The apparent worsening of patients treated with inadequate HBO in the current trial may be reflective of oxygen toxicity in the absence of the benefit offered by HBO at higher pressures.

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