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Title: Failure of normobaric oxygen therapy to reduce ischemic brain damage in rats

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Abstract: We investigated the effects of 24-h oxygen therapy on focal cerebral ischemia in rats. Under halothane anesthesia, a 3-0 nylon thread was introduced into the neck internal carotid artery to occlude the left middle cerebral artery (MCA). Under atmospheric pressure, group 1 animals inhaled standard air; group 2, 40% O₂; group 3, 60% O₂; and group 4, 100% O₂. Neuropathologic outcomes were quantified after a 24-h inhalation period. Infarct volumes tended to decrease in groups 2-4, but the decreases were not significant when compared with group 1. Hemispheric volume differences of groups 2-4 (27 +/- 18 mm³, 22 +/- 17 mm³, and 31 +/- 22 mm³, respectively) were less than that of group 1 (61 +/- 23 mm³, P < 0.05). Our results demonstrate that O₂ therapy reduces brain swelling in rats 24 h after MCA occlusion. However, a dose-dependent decrease in brain swelling was not observed. In addition, we failed to see a significant decrease in the infarct size.

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