

Oxycyte

The treatment of decompression sickness (DCS) with hyperbaric oxygen (HBO2) serves to decrease intravascular bubble size, increase oxygen (O2) delivery to tissue and enhance the elimination of inert gas. Emulsified perfluorocarbons (PFC) combined with breathing O2 have been shown to have similar effects animal models. We studied an ovine model of severe DCS treated with the intravenous PFC Oxycyte™ while breathing O2 compared to saline control also breathing O2.

Methods: Juvenile male sheep (N=67; weight 24.4 ± 2.10 kg) were compressed to 257 feet of sea water (fsw) in our multiple large-animal chamber where they remained under pressure for 31 minutes. Animals then were decompressed to surface pressure and randomized to receive either Oxycyte at 5mL/kg intravenously (IV) or 5mL/kg saline IV (both receiving 100% O2) 10 minutes after reaching surface pressure. Mortality was recorded at two hours, four hours, and 24 hours after receiving the study drug. Surviving animals underwent perfusion fixation and harvesting of the spinal cord at 24 hours. Spinal cord sections were assessed for volume of lesion area and compared.

Results: There was no significant difference in survival at two hours ($p=0.2737$), four hours ($p=0.2101$), or 24 hours ($p=0.3171$). Paralysis at 24 hours was not significantly different. However, spinal cord lesion area was significantly smaller in the Oxycyte group as compared to the saline group, with median spinal cord lesion areas 0.65% vs. 0.94% ($p=0.0107$).

Conclusion: In this ovine model of severe DCS the intravenous PFC Oxycyte did not reduce mortality but did ameliorate spinal cord injury when used after the onset of DCS ¹⁾.

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Cronin WA, Khan K, Hall AA, Bodo M, Mahon RT. The effect of the perfluorocarbon emulsion Oxycyte™ in an ovine model of severe decompression illness. Undersea Hyperb Med. 2021 First-Quarter;48(1):25-31. PMID: 33648030.

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