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Title: Salutary consequences of oxygen therapy on the long-term outcome of hemorrhagic shock in awake, unrestrained rats

Authors: Bitterman, N
Katz, E
Melamed, Y
Bitterman, H

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Abstract: Decreased oxygen delivery and cellular hypoxia are major factors in the pathophysiology of shock. We studied the effects of 100% O₂ at 0.1 and 0.3 MPa (1 and 3 atm abs) in severe hemorrhagic shock in awake, unrestrained rats. Shock was induced by withdrawing 50% of the total blood volume within 120 min. Blood pressure, heart rate, and the electroencephalogram (EEG) were recorded during the first 6 h of the protocol. The animals were observed for 7 days. The shock protocol resulted in 60 and 90% mortality after 1 day and at the end of 7 days, respectively. A single 90-min exposure to O₂ at 0.1 and 0.3 MPa, which was started 30 min after bleeding, maintained mean arterial blood pressure at significantly higher values compared to untreated controls throughout the exposure period ($P < 0.05$). Oxygen therapy at both doses also improved the long-term survival rate and survival time significantly ($P < 0.01$). No clinical or EEG sign of CNS O₂ toxicity was detected in O₂-treated animals. Our results indicate that O₂ given alone after severe bleeding exerts a beneficial effect on the long-term outcome of hemorrhagic shock in awake, unrestrained rats.

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