



Hyperoxia toxicity in septic shock patients according to the Sepsis-3 criteria: a post hoc analysis of the HYPER2S trial

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Mots-clés Hyperlactatemia [11], Hyperoxia [12], Oxygen extraction [13], Oxygen transport [14], Sepsis-3 [15], septic shock [16]

Background

Criteria for the Sepsis-3 definition of septic shock include vasopressor treatment to maintain a mean arterial pressure > 65 mmHg and a lactate concentration > 2 mmol/L. The impact of hyperoxia in patients with septic shock using these criteria is unknown.

Methods

A post hoc analysis was performed of the HYPER2S trial assessing hyperoxia versus normoxia in septic patients requiring vasopressor therapy, in whom a plasma lactate value was available at study inclusion. Mortality was compared between patients fulfilling the Sepsis-3 septic shock criteria and patients requiring vasopressors for hypotension only (i.e., with lactate \leq 2 mmol/L).

Results

Of the 434 patients enrolled, 397 had available data for lactate at inclusion. 230 had lactate > 2 mmol/L and 167 \leq 2 mmol/L. Among patients with lactate > 2 mmol/L, 108 and 122 were "hyperoxia"- and "normoxia"-treated, respectively. Patients with lactate > 2 mmol/L had significantly less COPD more cirrhosis and required surgery more frequently. They also had higher illness severity (SOFA 10.6 ± 2.8 vs. 9.5 ± 2.5 , $p = 0.0001$), required more renal replacement therapy (RRT), and received vasopressor and mechanical ventilation for longer time. Mortality rate at day 28 was higher in the "hyperoxia"-treated patients with lactate > 2 mmol/L as compared to "normoxia"-treated patients (57.4% vs. 44.3%, $p = 0.054$), despite similar RRT requirements as well as vasopressor and mechanical ventilation-free days. A multivariate analysis showed an independent association between hyperoxia and mortality at day 28 and 90. In patients with lactate \leq 2 mmol/L, hyperoxia had no effect on mortality nor on other outcomes.

Conclusions

Our results suggest that hyperoxia may be associated with a higher mortality rate in patients with septic shock using the Sepsis-3 criteria, but not in patients with hypotension alone.

Résumé en anglais

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