GE Healthcare

Abstract

Preliminary observations in systemic oxygen consumption during targeted temperature management after cardiac arrest

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Published in Resuscitation, June 2018 Volume 127, Pages 89–94.

AIM

Limited data suggests low oxygen consumption (VO_2), driven by mitochondrial injury, is associated with mortality after cardiac arrest. Due to the challenges of measurement in the critically ill, post-arrest metabolism remains poorly characterized. We monitored VO_2, carbon dioxide production (VCO_2) and the respiratory quotient (RQ) in post-arrest patients and explored associations with outcome.

METHODS

Using a gas exchange monitor, we measured continuous VO_2 and VCO_2 in post- arrest patients treated with targeted temperature management. We used area under the curve and medians over time to evaluate the association between VO_2, VCO_2, RQ and the VO_2:lactate ratio with survival.

RESULTS

In 17 patients, VO_2 in the first 12 h after return of spontaneous circulation (ROSC) was associated with survival (median in survivors 3.35 mL/kg/min [2.98,3.88] vs. non-survivors 2.61 mL/kg/min [2.21,2.94], p = .039). This did not persist over 24 h. The VO_2:lactate ratio was associated with survival (median in survivors 1.4 [IQR: 1.1,1.7] vs. non-survivors 0.8 [IQR: 0.6,1.2] p < 0.001). Median RQ was 0.66 (IQR 0.63,0.70) and 71% of RQ measurements were <0.7. Patients with initial RQ < 0.7 had 17% survival versus 64% with initial RQ > 0.7 (p = .131). VCO_2 was not associated with survival.

CONCLUSIONS

There was a significant association between VO_2 and mortality in the first 12 h after ROSC, but not over 24 h. Lower VO_2: lactate ratio was associated with mortality. A large percentage of patients had RQs below physiologic norms. Further research is needed to explore whether these parameters could have true prognostic value or be a potential treatment target.

Full article is available on the Resuscitation journal website: https://www.resuscitationjournal.com/article/S0300-9572(18)30160-6/fulltext

Resuscitation is an official journal of the European Resuscitation Council.

JB57579XX 5/18