



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

Amy Uber, Anne V. Grossestreuer, Catherine E. Ross, Parth V. Patel, Ambica Trehan, Michael W. Donnino, Katherine M. Berg

Published in Resuscitation, June 2018 Volume 127, Pages 89–94. © 2018 Elsevier B.V.

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](https://www.resuscitationjournal.com/article/S0300-9572(18)30160-6/fulltext)

Resuscitation is an official journal of the European Resuscitation Council.

Imagination at work

Product may not be available in all countries and regions. Full product technical specification is available upon request. Contact a GE Healthcare Representative for more information. Please visit www.gehealthcare.com/promotional-locations.

Data subject to change.

© 2018 General Electric Company.

GE, the GE Monogram, Imagination at work are trademarks of General Electric Company.

All third-party trademarks are the property of their respective owners.

Reproduction in any form is forbidden without prior written permission from GE. Nothing in this material should be used to diagnose or treat any disease or condition. Readers must consult a healthcare professional.

JB57579XX 5/18