Higher lactate oxygen index rather than arterial lactate after resuscitation indicates poor 24h-survival outcomes in a Porcine Model of Prolonged Cardiac Arrest

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Results

Background

Increases in arterial lactate (ALac) and lactate oxygen index (LOI) have been demonstrated as useful indicators of poor prognosis in critically ill patients. In the present study, we investigated the changes of LAC and LOI after successful cardiopulmonary resuscitation (CPR) in a porcine model of prolonged cardiac arrest (CA). We hypothesized higher LOI rather than ALac after resuscitation might indicate poor 24h-survival outcomes of prolonged CA.

Methods

Animal Model

Twelve male domestic pigs weighing 40 ± 3kg were utilized. Ventricular fibrillation was electrically induced and untreated for 10 minutes. All animals were successfully resuscitated. Blood gas samples were obtained from the internal jugular venous and abdominal descending aorta at baseline (BL) and 30 minutes, 120 minutes after resuscitation (PR). LOI was calculated based on the arterial (CaO2) and jugular venous oxygen (CjO2) content:

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\text{CaO}_2 = (1.34 \times \text{Hb} \times \text{SaO}_2 + (0.003 \times \text{paO}_2)
\]

\[
\text{CjO}_2 = (1.34 \times \text{Hb} \times \text{SjO}_2 + (0.003 \times \text{pj}_2)
\]

LOI = (arterial lactate-jugular vein lactate)/(CaO2-CjO2).

Figure 1. Changes in arterial lactate and lactate oxygen index after cardiopulmonary resuscitation.

![Graph showing changes in arterial lactate and lactate oxygen index after CPR.]

Five animals died within 24 hours, while the other seven survived more than 24 hours. The level of ALac in all animals significantly increased at PR30 and reduced back to BL. However, no obvious differences in ALac were observed between survival and non-survival animals. LOI in all animals increased after resuscitation when compared with BL. LOI was higher at PR30 and PR120 in non-survival animals compared with survival animals.

Conclusions

Greater LOI rather than ALac serves as a sensitive indicator of a poor survival outcome following prolonged CA.

References


Disclosure

None