



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.

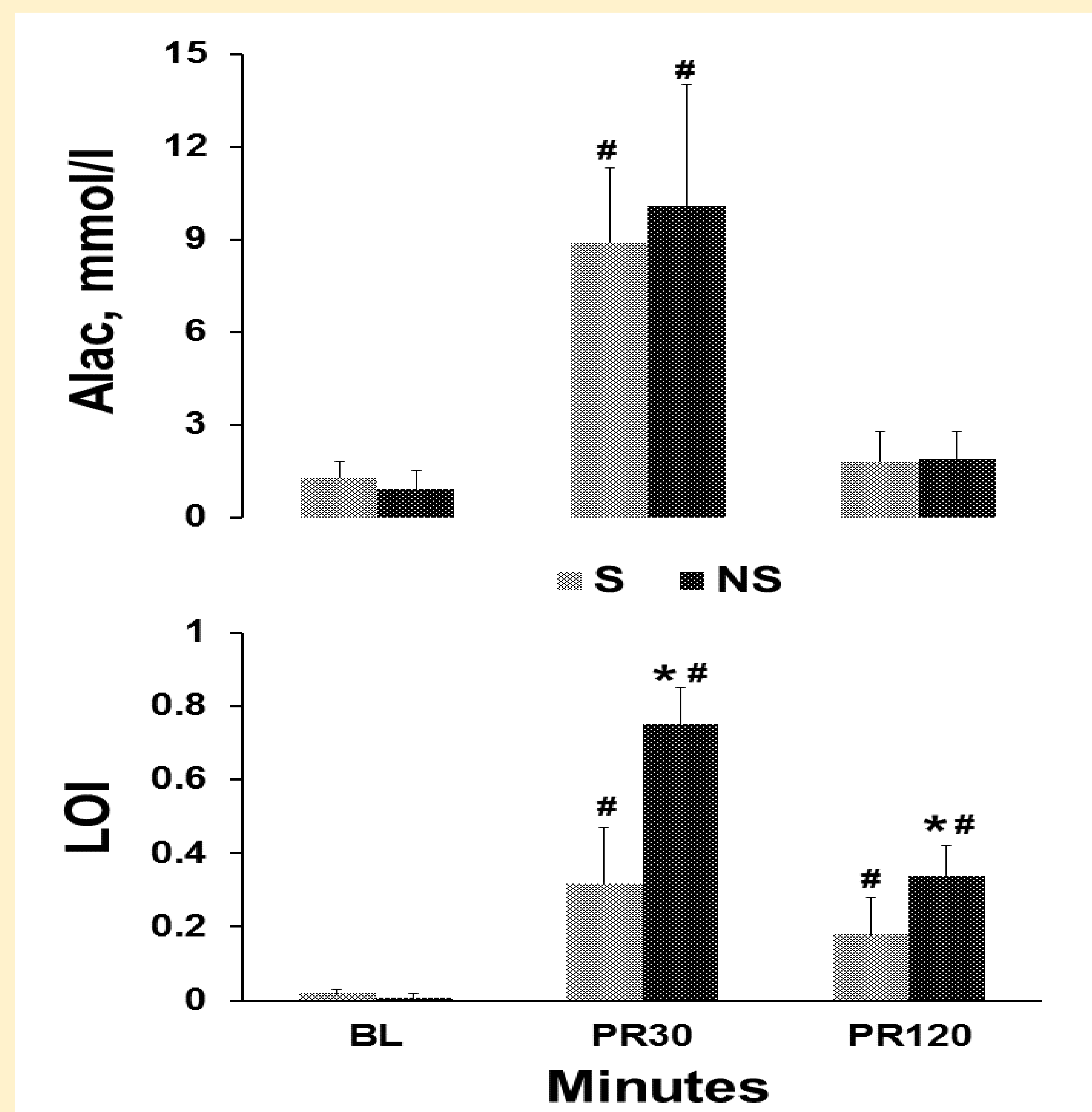
Methods

Animal Model

Twelve male domestic pigs weighing 40 ± 3 kg 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 (CaO_2) and jugular venous oxygen (CjO_2) content:
 $CaO_2 = (1.34 \times Hb \times SaO_2) + (0.003 \times paO_2)$
 $CjO_2 = (1.34 \times Hb \times SjO_2) + (0.003 \times pjO_2)$
 $LOI = -(\text{arterial lactate} - \text{jugular vein lactate}) / (CaO_2 - CjO_2)$.

Results

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



ALac, artery lactate; LOI, lactate oxygen index; S, survival animals; NS, non-survival animals; BL, baseline; PR, post resuscitation.
 # $P < 0.05$ vs baseline; * $P < 0.05$ vs survival animals.

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

- Jansen T C, Bommel J V, Bakker J. Critical care medicine.2009;37(10):2827-2839.
- Metz C, Holzschuh M, Bein T, et al. Journal of Cerebral Blood Flow and Metabolism.1998;18:332-343.

Disclosure

None