



## Background

Previous studies have shown that asphyxia cardiac arrest (ACA) has different pathophysiologic mechanisms from dysrhythmic cardiac arrest (DCA). In the present study, we compared gas exchange during cardiopulmonary resuscitation (CPR) between ACA and DCA with similar hypoxia time in a porcine model. We hypothesized that with a similar hypoxia time gas exchange is worse in ACA compared to DCA..

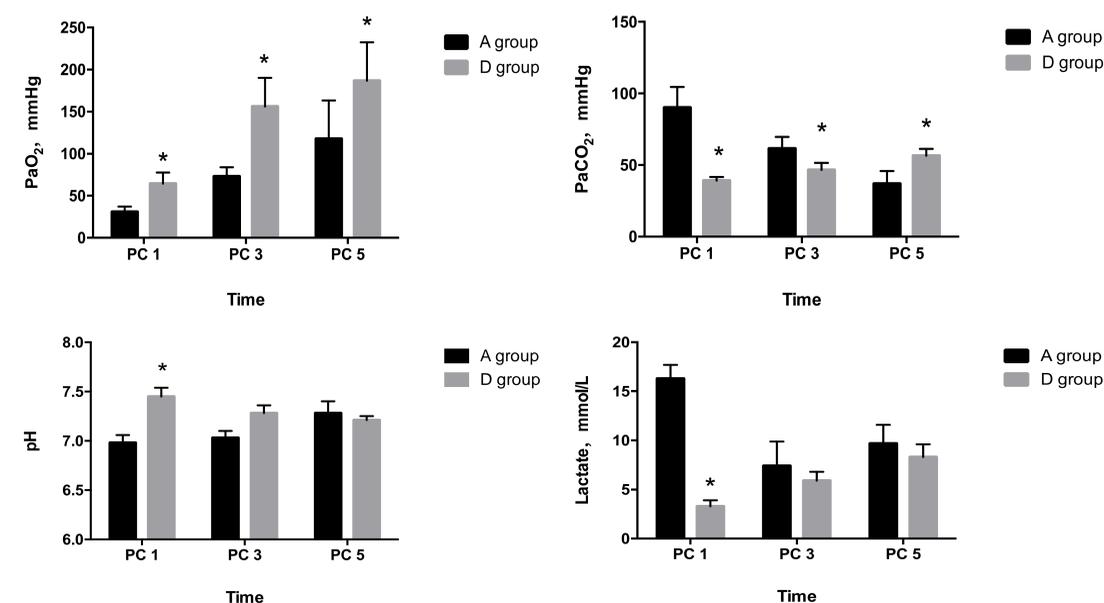
## Methods

Ten male domestic pigs weighing  $38 \pm 2$  kg were randomized to induce ACA (group A) or DCA (group D). ACA was induced by endotracheal tube (ETT) clamping with no treatment for 5 min; DCA was electrically induced with no treatment for 12 min. CPR was initiated by unclamping the ETT and providing 100% oxygen ventilation. After 2 min of CPR, epinephrine was administered and defibrillation was attempted after 6 min of CPR. Arterial gases and the level of lactate were measured at 1, 3, 5min of CPR (PC1, PC3, PC5).

## Results

Pre-arrest duration in group A was  $6.91 \pm 0.53$  min; the total hypoxia time in ACA was  $11.91 \pm 0.53$  min which did not differ from DCA ( $p > 0.05$ ). In comparison with group D, PaO<sub>2</sub> in group A was lower during the period of CPR ( $31.0 \pm 6.2$  mmHg vs.  $64.4 \pm 14.3$  mmHg;  $73.0 \pm 10.8$  mmHg vs.  $156.2 \pm 33.9$  mmHg;  $117.8 \pm 45.5$  mmHg vs.  $186.8 \pm 45.6$  mmHg, PC1, PC3, PC5 respectively, all  $p < 0.05$ ). PaCO<sub>2</sub> was higher in group A at PC1 and PC3 ( $90.2 \pm 14.3$  mmHg vs.  $39.2 \pm 2.5$  mmHg;  $61.5 \pm 8.2$  mmHg vs.  $46.5 \pm 5.0$  mmHg, both  $p < 0.05$ ), but lower than group D at PC5 ( $36.9 \pm 8.9$  mmHg vs.  $56.5 \pm 4.8$  mmHg,  $p < 0.05$ ).

Figure. Comparison of arterial blood gases between group A and D during PCR.



Group A, asphyxia group; Group D, dysrhythmic group; \*  $p < 0.05$  vs. A group.

## Results

The level of lactate in group A was higher at PC1 in comparison with group D ( $16.3 \pm 1.4$  mmol/l vs.  $3.3 \pm 0.6$  mmol/l,  $p < 0.05$ ), and the pH was lower ( $6.98 \pm 0.08$  vs.  $7.42 \pm 0.09$ ,  $p < 0.05$ ), however, no statistical significance was found at PC3 and PC5.

## Conclusions

5 min ACA leads to worse blood gases than those of DCA with similar hypoxia time in a porcine model.

## References

1. Morten P, Elizabeth D, Kjetil S, et al. Resuscitation, 77(1), 35–38.
2. Mader T, Kellogg A, Hess J, et al. Prehospital Emergency Care, 14(4), 491–495.