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 cardio-pulmonary 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±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, 5 min of CPR (PC1, PC3, PC5).

Results

Pre-arrest duration in group A was 6.91 ± 0.53 min; the total hypoxia time in ACA was 11.91 ± 0.53 min which did not differ from DCA (p=0.05). In comparison with group D, PaO2 in group A was lower during the period of CPR (31.0±6.2 mmHg vs. 64.4±14.3 mmHg; 73.0±10.8 mmHg vs. 156.2±33.9 mmHg; 117.8±45.5 mmHg vs. 186.8±45.6 mmHg, PC1, PC3, PC5 respectively, all p<0.05). PaCO2 was higher in group A at PC1 and PC3 (90.2±14.3 mmHg vs. 39.2±2.5 mmHg; 61.5±8.2 mmHg vs. 46.5±5.0 mmHg, both p<0.05), but lower than group D at PC5 (36.9±8.9 mmHg vs. 56.5±4.8 mmHg, p<0.05).

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

References