Influence of dobutamine on the variables of systemic haemodynamics, metabolism, and intestinal perfusion after cardiopulmonary resuscitation in the rat

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BACKGROUND: Global left ventricular dysfunction after successful resuscitation from cardiac arrest may be treated successfully with dobutamine but the effects on intestinal perfusion are unknown. METHODS: In 24 male Sprague-Dawley rats ventricular fibrillation was induced. After 4 min of untreated cardiac arrest, precordial chest compression was performed for 4 min; adrenaline (epinephrine) (90 microg kg(-1)) was injected, followed by defibrillation. Return of spontaneous circulation was achieved in 18 animals, which were allocated to receive saline 0.9% (control group, n = 6), dobutamine at 5 microg kg(-1) min(-1) (n = 6) or dobutamine at 10 microg kg(-1) min(-1) (n = 6). Measurements of haemodynamic variables and intestinal tonometer P (CO2) were made before induction of ventricular fibrillation and 15, 30, 60, and 120 min postresuscitation. RESULTS: At 120 min postresuscitation, mean aortic pressure was 82 +/- 20, 104 +/- 19, and 113 +/- 15 mmHg for the control group, the dobutamine (5 microg kg(-1) min(-1)) group and the dobutamine (10 microg kg(-1) min(-1)) group (P < 0.05 for comparison of the dobutamine (10 microg kg(-1) min(-1)) group versus the control group). Respective abdominal aortic blood flow was 107 +/- 16, 133 +/- 49, and 145 +/- 18 ml min(-1) kg(-1) (P < 0.05 for comparison of the dobutamine (10 microg kg(-1) min(-1)) group versus the control group), and superior mesenteric artery blood flow was 25 +/- 9, 28 +/- 8, and 33 +/- 8 ml min(-1) kg(-1). Arterial lactate was significantly higher (P < 0.05) in the control group (2.3 +/- 0.6 mmol l(-1)) than in the dobutamine (5 microg kg(-1) min(-1)) group (1.6 +/- 0.3 mmol l(-1)) and dobutamine (10 microg kg(-1) min(-1)) group (1.5 +/- 0.3 mmol l(-1)). Tonometrically derived P(CO2) gap was highly elevated at 15 min of postresuscitation and returned to prearrest level at 120 min postresuscitation in all groups. CONCLUSIONS: Dobutamine enhances the recovery of global haemodynamic and metabolic variables early after cardiac arrest.
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