Post-conditioning adversely affects the outcome of cardiopulmonary resuscitation during untreated cardiac arrest

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Results

Background

Ischemic preconditioning can reduce reperfusion injury in experimental animals, but is not feasible in clinical practice. Moving a preconditioning stimulus to the beginning of reperfusion (post-conditioning) is also effective in animal models. It is unclear if the concept of post-conditioning early during CPR has any benefit. We hypothesized that brief periods of withholding precordial compression during early CPR will improve resuscitation outcome and post-resuscitation myocardial function.

Methods

We randomized 16 male Sprague-Dawley rats weighing 450–550g to: 1) control; 2) ischemic post-conditioning (PC). Ventricular fibrillation was induced and untreated for 8 min. In the control group, precordial compression was uninterrupted for 8 min. In the experimental group, ischemic post-conditioning was induced with 4 cycles of 10 s of chest compressions followed by a 10 s pause initiated at 2 min of chest compression. Ejection fraction (EF) was measured hourly for 4 h and serum troponin I (cnTI) was measured at baseline and 4 h after return of spontaneous circulation (ROSC). Survival duration was recorded.

Figure 1.

The concept of PC early during CPR did not improve post-resuscitation myocardial function or survival, and may just represent “poor CPR”.

All animals were resuscitated successfully. After ROSC, control rats had a higher EF than those in the IPC group (Fig 1). Compared to baseline, cnTI was increased in both groups 4 h after ROSC. The concentration of cnTI was higher in the IPC (6.10±0.17 ng/ml) compared to the control (3.89±0.02 ng/ml p<0.05) group when measured after ROSC. Survival was longer in the control group (Fig 2).

Conclusions

The concept of PC early during CPR did not improve post-resuscitation myocardial function or survival, and may just represent “poor CPR”.

Disclosure

None