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ONE-SHOCK VERSUS CONTINUOUS DEFIBRILLATION IN AN 8-MIN VENTRICULAR FIBRILLATION CANINE MODEL OF CARDIAC ARREST

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Objectives To investigate the resuscitation effect of a one-shock defibrillation protocol versus conventional continuous defibrillation with treatment variation imposed by active compression-decompression CPR (ACD CPR) or standard CPR (STD CPR).

Methods and results Ventricular fibrillation (VF) was induced in anaesthetised and ventilated canines. After 8 min of untreated VF, 24 canines were randomly assigned to four groups representing all combinations of the one-shock versus continuous defibrillation and two different CPR regimens (ACD CPR, STD CPR). Initial shock(s) were delivered, followed by 120 sec of CPR, and the treatment was repeated until resuscitation was successful or for 15 min. The ratio of compression to ventilation was 30:2. Endpoints were restoration of spontaneous circulation (ROSC), defined as spontaneous systolic arterial pressure >50 mmHg, when epinephrine (0.02 mg/kg) was given intravenously; and resuscitation, defined as maintaining systolic arterial pressure >50 mmHg at the 24-h study endpoint. The one-shock protocol was associated with improved outcome: total resuscitation time was reduced because mean CPR interruption time was reduced from 31% for continuous defibrillation to 19% for the one-shock protocol ($p=0.015$), and survival was increased from 67% to 100%, respectively ($p=0.004$). The two CPR methods did not differ in outcomes, but survival was increased to 100% for both methods with the one-shock protocol.

Results Ventricular fibrillation (VF) was induced in anaesthetised and ventilated canines. After 8 min of untreated VF, 24 canines were randomly assigned to four groups representing all combinations of the one-shock versus continuous defibrillation and two different CPR regimens (ACD CPR, STD CPR). Initial shock(s) were delivered, followed by 120 sec of CPR, and the treatment was repeated until resuscitation was successful or for 15 min. The ratio of compression to ventilation was 30:2. Endpoints were restoration of spontaneous circulation (ROSC), defined as spontaneous systolic arterial pressure >50 mmHg, when epinephrine (0.02 mg/kg) was given intravenously; and resuscitation, defined as maintaining systolic arterial pressure >50 mmHg at the 24-hr study endpoint. The one-shock protocol was associated with improved outcome: total resuscitation time was reduced because mean CPR interruption time was reduced from 31% for continuous defibrillation to 19% for the one-shock protocol ($p=0.015$), and survival was increased from 67% to 100%, respectively ($p=0.004$). The two CPR methods did not differ in outcomes, but survival was increased to 100% for both methods with the one-shock protocol.

Conclusions In this 8-min VF canine model of cardiac arrest, one-shock CPR versus continuous defibrillation improved survival. ACD CPR is no different from STD CPR in cardiac resuscitation.