sisted of 17 males (mean age 58.3 ±18.8 years) and 13 females (68.7 ±12.6 years). The basic disease of CGS was predominantly acute myocardial infarction in 20 patients (66.7%), followed by arrhythmia in three patients (18.0%), congestive heart failure in five patients (16.7%), and myocarditis and valvular disease in one patient (3.3%). The involved organs were the lung in 26 (86.7%) patients, liver in 24 patients (80%), and kidneys in 16 patients (53.3%), respectively. Nine patients were found to have the complication of Disseminated Intravascular Coagulation (DIC). The mortality rate was 43%.

Conclusion: The mortality rate is higher in the patient group with severe organ injury. A tendency also was evident, indicating that the larger the number of involved organs, the higher the mortality rate.

202
Active Compression-Decompression in CPR

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A new therapeutic principle in cardiopulmonary resuscitation (CPR) recently has been described. Alternate ("active") compression and decompression (ACD) is applied by means of a special device (Ambu CardioPump).[1] The intermittent negative pressure permits four possible improvements of CPR: 1) Increase of "cardiac output" due to suction of blood into the thoracic cage before the next compression closes venous valves; 2) Decrease in central venous pressure facilitates cerebral perfusion (which under conventional CPR nearly may cease); 3) Increased pulse amplitude in aorta implies better coronary perfusion, and thus may facilitate the response to various resuscitation measures; and 4) According to the principles of high-frequency ventilation, small tidal volumes improve alveolar gas exchange.

The first prehospital experiences with this device are presented. The need to deviate from the recommendations concerning compression- and ventilation-rates, suggested by the American Heart Association, soon was realized.[2] These guidelines could not foresee the completely altered cardiopulmonary dynamics obtained with ACD.

Using a compression rate of 40–60/minute (min) and a ventilation rate of 4/min (while maintaining oxygen supply to the tube between positive-pressure ventilations), a good peripheral pulsation, enabling reliable pulse oximetry, was achieved in a preliminary prehospital study. No patients obtained less than 92% oxygen saturation. This study is continuing and its results will be presented.

References

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203
Active Compression-Decompression Resuscitation: Effect on the Left Ventricular Volume and Transmitral Flow

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Introduction: Recently, cardiopulmonary resuscitation (CPR) incorporating active compression and decompression (ACD) of the chest has been demonstrated to improve hemodynamics in an animal model.

Hypothesis: This study was designed to test the hypothesis that ACD-CPR would increase transmitral flow and end-decompression left ventricular volume (LVV) when compared to standard manual CPR.

Methods: The ACD device was applied mid-sternum in five consecutive patients (3 male, age 44 ±18.5 years) and compared sequentially (in random order) to standard CPR. Both techniques were performed at 80 compressions/minutes, 1.5–2.0 inch compression depth, and a 50% duty cycle. Transesophageal echocardiographic data obtained in each patient during both CPR techniques included: velocity time-integral (VTI) of transmitral pulse-wave doppler recordings and two-dimensional images of left ventricle in long axis. With each CPR technique, planimetry volume measurements of the left ventricle were obtained at end-compression (EC) and end-decompression (ED) and the difference expressed as the stroke volume (SV).

Results:

CPR	EC (ml)	ED (ml)	SV (ml)	VTI
Standard	49.7 ±9.3	69.4 ±10.8	17.6 ±5.2	7.8 ±2.3
ACD	48.6 ±8.5	81.3 ±12.5*	32.6 ±6.8*	15.8 ±4.3*

*$p < .01$

Conclusions: Improved transmitral flow, end-decompression left ventricular volume, and stroke volume are seen with active compression-decompression resuscitation suggesting a biphasic cardiothoracic cycle of flow. Active decompression of the chest is an important adjunct to standard CPR.