New approach to CPR saves more lives

Study: Constant chest compressions triple survival in out-of-hospital cases

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NEW YORK - A new approach to cardiac resuscitation designed to maintain nearly constant chest compressions triples the rate of survival of "out-of-hospital" cardiac arrest, study findings suggest.

"Out-of-hospital cardiac arrest is a major public health problem and a leading cause of death," note the study investigators. "Although early defibrillation with automated external defibrillators improves survival, early defibrillation is rare and few patients with out-of-hospital cardiac arrest survive."

The new approach — termed minimally interrupted cardiac resuscitation or MICR — focuses on maximizing blood flow to the heart and brain through a series of coordinated interventions. It includes an initial series of 200 uninterrupted chest compressions, heart rhythm analysis with a single shock, 200 immediate post-shock chest compressions before the pulse check, early administration of epinephrine to stimulate the heart, and delayed placement of a flexible plastic tube into the trachea for the purpose of ventilating the lungs.

Dr. Bentley J. Bobrow at the Mayo Clinic in Scottsdale, Arizona, and associates evaluated the protocol in a study comparing survival before and after MICR training of fire department EMS personnel in two Arizona cities.

Among 886 patients who suffered cardiac arrest in the two cities, survival-to-hospital discharge increased from 4 of 218 patients (1.8 percent) in the before MICR training group to 36 of 668 patients (5.4 percent) in the after MICR training group.

In a subgroup of 174 patients with a "witnessed" cardiac arrest and a shockable rhythm, survival increased from 2 of 43 patients (4.7 percent) in the before MICR training group to 23 of 131 patients (17.6 percent) in the after MICR training group.

In a second analysis, the investigators determined outcomes of 1,799 people that did not receive MICR with 661 that did. Survival to hospital discharge was 3.8 percent and 9.1 percent, respectively. Survival rates among 528 patients with witnessed cardiac arrest were 11.9 percent and 28.4 percent, respectively.

Why should MICR be associated with improved outcomes after out-of-hospital cardiac arrest? One major contributor to the poor survival rates of patients with out-of-hospital cardiac arrest is prolonged inadequate blood flow to the heart and brain, the investigators explain. "During resuscitation efforts, the forward blood flow produced by chest compressions is so marginal that any interruption of chest compressions is extremely, especially for favorable neurological outcomes," they write. "Excessive interruptions of chest compressions by pre-hospital personnel are common. Therefore, MICR emphasizes uninterrupted chest compressions."

"This study," Drs. Mary Ann Peberdy and Joseph P. Ornato, at Virginia Commonwealth University in Richmond write in a related editorial, "represents confirmation that the quality of CPR, particularly the need for minimally interrupted chest compression ... is a meaningful development in the evolution of resuscitation science."

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