

Case-Control Study of AutoPulse™ for Out-of-Hospital Cardiac Arrest

Ornato JP, Ong ME, Edwards DP, Best AM, Ines CS, Hickey S, Clark B, Williams D, Powell R, Overton, J, Peberdy MA. Case-control study of AutoPulse™ for out-of-hospital cardiac arrest. Resuscitation Science Symposium, American Heart Association Scientific Sessions, Nov 12, 2005.

Purpose

The purpose of this study was to compare the resuscitation outcomes in adult patients with out-of-hospital cardiac arrest (OHCA) treated with manual (MAN) vs. AutoPulse™ (A-CPR) cardiopulmonary resuscitation.

Design

We conducted a phased, observational evaluation before and after paramedics on EMS ambulances in Richmond, Virginia switched from MAN to A-CPR as the standard method for providing closed chest compression during resuscitation. A-CPR was applied very early in resuscitation.

Results

Between January 2001 and March 2005 there were 499 cases during the manual phase and 284 cases during the A-CPR phase. In the latter, A-CPR was used in 74.2% of cardiac arrest cases. The most common reasons for non-use included successful resuscitation or discontinuation of resuscitation prior to device application, or short transport time to a nearby hospital. Patients in the two phases were comparable in all respects except for a slightly faster response time interval (mean difference of 26 sec) and more Emergency Medical Services (EMS) witnessed arrests (18.7% vs. 12.6%) during the A-CPR phase. Survival rates were significantly better with A-CPR vs. manual CPR: return of spontaneous circulation in 34.5% vs. 20.2 % ($p = .00001$); survival to hospital admission 20.9% vs. 11.1% ($p = .0002$); survival to hospital discharge 9.7% vs. 2.9% ($p = .0001$). Virtually all of the survival to hospital discharge benefit of AutoPulse™ was in patients with ventricular fibrillation who were treated by paramedics with a short response time interval. Neurological outcome of survivors was similar between the two groups. The number needed to treat (NNT) for the unadjusted outcome survival to discharge was 15 (95% CI 9, 33).

Conclusion

Results of this study suggest that a strategy employing A-CPR on rapidly-responding EMS ambulances improves survival to hospital discharge in adult OHCA victims.