

Effect of a CPR Assist Device on Survival to Emergency Department Arrival in Out of Hospital Cardiac Arrest

Swanson M, Poniatoski M, O'Keefe M, Shedd JG. Effect of a CPR assist device on survival to emergency department arrival in out of hospital cardiac arrest. *Circulation*. 112(17):II-1106, Oct 25, 2005.

OBJECTIVE

EVAC Ambulance, serving Volusia County, Florida (1,207 square miles, population 468,000), evaluated an automated, load-distributing-band chest compression device (AutoPulse, ZOLL Medical Corporation) to determine its effect on short-term survival. This device has been previously shown to improve hemodynamics in humans when compared to manual cardiopulmonary resuscitation (M-CPR). An intention to treat, concurrently controlled, retrospective review was undertaken to determine if the AutoPulse had altered short-term patient outcome.

METHODS

In one-third (n=118) of all out-of-hospital cardiac arrest responses, AutoPulse cardiopulmonary resuscitation (A-CPR) was used by advanced life support certified paramedics until return of spontaneous circulation ensued or until death was declared. The primary end-point evaluated was patient survival to an emergency department with measurable spontaneous pulses (short-term survival). All cardiac arrest data were compiled from dispatch records, patient care reports, and monitor/defibrillator records. The M-CPR comparison group (n=405) received the same treatment but by paramedics who did not have A-CPR. During the study period, cardiac arrest treatment protocols followed AHA Guidelines 2000.

RESULTS

There were no differences between groups in patient characteristics or other factors typically associated with cardiac arrest survival. A-CPR increased the primary outcome overall (M-CPR 19%, ACPR 29%, OR 1.7, 95% CI 1.1-2.8, p=0.02). When patients were classified by initial presenting rhythm, shockable rhythms (28% of patients) showed no difference in outcome (M-CPR 33%, A-CPR 31%, OR 0.9, 95% CI 0.4-2.1, p=0.85) while pulseless electrical activity (PEA) and asystole showed increased short-term survival (PEA: M-CPR 17%, A-CPR 32%, OR 2.4, 95% CI 1.1-5.5, p=0.04; asystole: M-CPR 10%, A-CPR 24%, OR 2.8, 95% CI 1.2-6.3, p=0.01).

CONCLUSION

This study was limited by its size, lack of data on long-term survival and non-randomized design. These are early results and a more detailed study is underway. Despite these limitations, treatment with AutoPulse CPR showed a significant increase in short-term survival overall and in patients with initially nonshockable rhythms.