

Implementation of the 2005 American Heart Association Guidelines Improves in-Hospital Cardiac Arrest Survival Rates in a Community Hospital: a 5 Year Case Series

Ken Thigpen; Laura Simmons; Zinith James; Chad Neely

St. Dominic Hosp, Jackson, MS

Introduction: In-hospital cardiac arrests (IHCAs) result in the premature death of >300K patients annually in the US. IHCA survival rates average 17% and provide an indicator of in-hospital quality of care. Since 2006 outcomes after IHCA were tracked after implementation of the 2005 AHA Guidelines with the exception of therapeutic hypothermia. The IHCA care initiatives, termed high-performance (HP) CPR, included focus on compressions and use of the impedance threshold device (ITD). The ITD (ResQPOD®) increases circulation during HP-CPR by regulating intrathoracic pressure. In an effort to improve outcomes from IHCA, we compared our 5 year experience before and after HP-CPR.

Methods: The study was performed at St. Dominic Hospital in Jackson, Mississippi. Hospital discharge (HD) rates were compared before and after HP-CPR from 681 ICHA patients over five years, using Fisher's exact test, odds ratio (OR) and 95% confidence intervals (CI). Only the first IHCA occurring on the wards or in ICU were included. The ratios of survivors to HD to total patients (SHD:tp) based upon patients with a known initial rhythm of ventricular fibrillation/tachycardia (VF/VT), asystole (AS), or PEA were also compared before and after HP-CPR.

Results: There were 157 IHCAs in the historical control period. From 2006 to 2010, there were 524 patients with at least 1 IHCA. Age, gender, and distribution of presenting rhythms for IHCA patients remained constant between groups. HD rates were 28% (145/524) with HP-CPR vs 17% (27/157) historically ($p=0.009$, OR 1.8, CI [1.2, 2.9]). The % of patients with normal or near normal cerebral performance category score (1 or 2) at HD were similar between groups: 108/145 (74%) with HP-CPR vs 19/27 (70%) historically. During the control period, the SHD:tp (expressed as percent) for patients with VF/VT, AS, and PEA was 6.8, 7.2, 11.9 with HP-CPR, respectively, versus 5.1, 5.1, 5.7 historically ($P=0.035$ for PEA).

Conclusions: HP-CPR increased IHCA survival rates by 63% with the largest gain in patients with PEA initially. Survival benefit was associated with good neurological outcome and was sustained over four years, supportive of widespread adoption of this approach as the standard of care for IHCA.