

Introduction: Most ambulance communication officers receive minimal education on agonal breathing, often leading to unrecognized out-of-hospital cardiac arrest (OHCA). We sought to evaluate the impact of an educational program on cardiac arrest recognition, and on bystander CPR and survival rates. **Methods:** Ambulance communication officers in Ottawa, Canada received additional training on agonal breathing, while the control site (Windsor, Canada) did not. Sites were compared to their pre-study performance (before-after design), and to each other (concurrent control). Trained investigators used a piloted-standardized data collection tool when reviewing the recordings for all potential OHCA cases submitted. OHCA was confirmed using our local OHCA registry, and we requested 9-1-1 recordings for OHCA cases not initially suspected. Two independent investigators reviewed medical records for non-OHCA cases receiving telephone-assisted CPR in Ottawa. We present descriptive and chi-square statistics. **Results:** There were 988 confirmed and suspected OHCA in the “before” (540 Ottawa; 448 Windsor), and 1,076 in the “after” group (689 Ottawa; 387 Windsor). Characteristics of “after” group OHCA patients were: mean age (68.1 Ottawa, 68.2 Windsor); Male (68.5% Ottawa, 64.8% Windsor); witnessed (45.0% Ottawa, 41.9% Windsor); and initial rhythm VF/VT (Ottawa 28.9, Windsor 22.5%). Before-after comparisons were: for cardiac arrest recognition (from 65.4% to 71.9% in Ottawa $p = 0.03$; from 70.9% to 74.1% in Windsor $p = 0.37$); for bystander CPR rates (from 23.0% to 35.9% in Ottawa $p = 0.0001$; from 28.2% to 39.4% in Windsor $p = 0.001$); and for survival to hospital discharge (from 4.1% to 12.5% in Ottawa $p = 0.001$; from 3.9% to 6.9% in Windsor $p = 0.03$). “After” group comparisons between Ottawa and Windsor (control) were not statistically different, except survival ($p = 0.02$). Agonal breathing was common (25.6% Ottawa, 22.4% Windsor) and present in 18.5% of missed cases (15.8% Ottawa, 22.2% Windsor $p = 0.27$). In Ottawa, 31 patients not in OHCA received chest compressions resulting from telephone-assisted CPR instructions. None suffered injury or adverse effects. **Conclusion:** While all OHCA outcomes improved over time, the educational intervention significantly improved OHCA recognition in Ottawa, and appeared to mitigate the impact of agonal breathing.

Keywords: dispatch communications, cardiac arrest, agonal breathing

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Long-term functional outcome and health-related quality of life of elderly out-of-hospital cardiac arrest survivors

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Introduction: This study aims to describe the long-term functional outcome and health-related quality of life of elderly (≥ 65 years old) out-of-hospital cardiac arrest (OHCA) survivors in Victoria, Australia. **Methods:** Elderly OHCA patients who arrested between January 1st, 2010 and December 31st, 2014 were identified from the Victorian Ambulance Cardiac Arrest Registry (VACAR). Living status, Glasgow Outcome Scale-Extended (GOS-E), Euro-QoL (EQ-5D) and Twelve-item Short Form (SF-12) Health Survey were collected by telephone 12 months following the OHCA. **Results:** Emergency medical services attended on 14,678 elderly OHCA during the study period, 6,851 (46.7%) of which received a resuscitation attempt. Of these, 668 patients (9.8%) survived to hospital discharge. The mean age of the survivors was 75 (standard deviation (SD) 7.4) years and 504 (75.4%) were male. Eighty-five patients subsequently died within 12 months of their OHCA. A total of 483 patients were interviewed (response rate

82.9%). At 12 months, 313 responders (64.9%) were living at home without care. Most responders ($n = 324$ (67.2%)) had a good long-term functional recovery with a GOS-E ≥ 7 . The proportion of patients with a GOS-E ≥ 7 progressively decreased with increasing age (65-74 years: 66.1%, 75-84 years: 53.0%, ≥ 85 years: 27.3%). On the EQ-5D, the majority of survivors reported no problem with mobility ($n = 266$ (55.1%)), self-care ($n = 403$ (83.4%)), activity ($n = 293$ (60.6%)), pain ($n = 335$ (69.3%)) and anxiety ($n = 358$ (74.1%)). On the SF-12, the mean mental component summary was 56.3 (SD 6.6) while the mean physical component summary was 44.7 (SD 11.4) (both measures range from 0-100). Among the 1,951 patients who arrested in a supported accommodation, 849 (43.5%) had a resuscitation attempt, and of these, 21 survived to hospital discharge (2.5%). Only eight (1.0%) of these patients were still alive 12 months after the OHCA and one survivor (0.12%) had a good functional outcome (GOS-E ≥ 7). **Conclusion:** Most elderly OHCA survivors have an adequate long-term functional status and health-related quality of life. However, the likelihood of having a good functional recovery decreases with increasing age, and is rare for patients arresting in a supported accommodation.

Keywords: cardiac arrest, geriatric, quality of life

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Prehospital sodium bicarbonate use was associated with worse neurological outcomes among patients with out-of-hospital non-traumatic cardiac arrest

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Introduction: Sodium bicarbonate (SB) is still widely used for resuscitation in out-of-hospital cardiac arrest (OHCA) despite limited clinical indications but the effect on neurological recovery is unclear. **Methods:** From 2006 to 2016, we prospectively conducted a province-wide population-based observational study of adult non-traumatic OHCA patients managed by EMS. According to provincial guidelines, paramedics administered SB to OHCA patients based on their clinical assessment. Outcome of interest was favorable neurological outcome at hospital discharge, defined as CPC of 1 and 2 or modified Rankin scale of 3 or less. We performed multivariable logistic regression, comparing the proportion of outcome between SB and non-SB groups, further stratified by the median of the length of resuscitation. We also applied propensity score matching technique adjusting for baseline characters to the same model to reduce potential selection bias. **Results:** Of 13,008 OHCA patients, 4,699 (36.1%) were managed with SB. In the SB treated group, 64 / 4,699 (1.3%) patients had favorable neurological outcomes, compared to 823 / 8,309 (9.9%) in the non-SB treated group (crude odds ratio [OR] 0.12, 95% CI 0.09 to 0.16). In logistic regression model, SB was associated with decreased probability of favorable outcomes (adjusted OR 0.63, 95% CI 0.45 to 0.89). Similarly, with stratification by length of resuscitation, the SB group had a lower probability of favorable outcomes (≤ 24 min: adjusted OR 0.68, 95% CI 0.46 to 1.02, >24 min: adjusted OR 0.47, 95% CI 0.23 to 0.97). In 1:1 propensity matched cohort including 5,126 OHCA patients, the adjusted association also persisted (adjusted OR 0.59, 95% CI 0.39 to 0.89). **Conclusion:** Prehospital administration of SB to OHCA patients was associated with worse neurological outcomes and the trend persisted even after stratification by resuscitation length.

Keywords: cardiac arrest, out-of-hospital, sodium bicarbonate