



## Letter to the Editor

## Comparing Outcomes of Out-of-hospital Cardiac Arrest Between Prehospital Basic Life Support and Advanced Life Support<sup>†</sup>

Dear Editor,

Prehospital resuscitation of out-of-hospital cardiac arrest (OHCA) patients is part of the “chain of survival.” It has been well documented that early access, early cardiopulmonary resuscitation (CPR), and early defibrillation improve patients’ outcomes<sup>1,2</sup>. The debate continues, however, whether advanced life support (ALS) service is better than basic life support (BLS) service. Although Stiell et al<sup>2</sup> and Ma et al<sup>3</sup> reported no improvement in survival rate with the use of ALS, their studies show that it does significantly improve intermediate outcomes.

Is BLS not good? To investigate this hypothesis, we conducted a 1-year retrospective study to evaluate if BLS provides poorer outcomes for nontraumatic OHCA patients than ALS in prehospital settings. From January 1 to December 31, 2005, we reviewed 114 consecutive OHCA patients sent to Mackay Memorial Hospital’s emergency department by an emergency medical service. All received continued CPR on arrival. We divided these patients into two groups: the ALS group was resuscitated by emergency paramedics, who could provide necessary endotracheal intubation and intravenous access with epinephrine administration, and the BLS group was resuscitated by emergency medical technicians, who could perform basic CPR and defibrillation, if necessary. We extracted and compared information about these patients’ age, sex, witnesses, prehospital time intervals and management, blood pH, and outcome (Table 1). We used Chi-square tests and Fisher’s exact tests for categorical variables and independent-sample *t* tests for continuous variables. We considered a *p* value less than 0.05 as statistically significant.

The patients’ overall survival rate was 10.5%. A comparison of patient outcomes between the BLS and ALS groups shows that the former did not decrease either the survival or the admission rate, but it significantly increased the return of spontaneous circulation rate (30.0% vs. 53.6%, *p* = 0.026). Our results show that the BLS group had better intermediate outcomes, but not better final outcomes, than the ALS group. We interpreted these data to indicate that the ALS service providers spent significantly more time on scene than the BLS service providers (17.0 ± 7.1 minutes vs. 9.8 ± 4.5 minutes, *p* < 0.001). We thought that this time difference was caused by prehospital endotracheal intubation and intravenous access with drug administration in the ALS group. As Olasveengen et al<sup>4</sup> concluded, prehospital intravenous access and drug administration did not improve OHCA patients’ survival rate. In prehospital situations, we supposed that these difficult and

**Table 1**

Comparison of demographic characteristics and outcomes between BLS and ALS services (*n* = 114)<sup>a</sup>

	BLS ( <i>n</i> = 84)	ALS ( <i>n</i> = 30)	<i>p</i>
Male	47 (56.0)	24 (80.0)	0.020 <sup>b</sup>
Age (yr)	66.7 ± 15.4	71.5 ± 16.6	0.15
Elderly (≥65 yr)	53 (63.1)	22 (73.30)	0.310
Witnessed by bystander	54 (64.3)	19 (63.3)	0.926
Prehospital interval (min)	18.4 ± 5.5	25.0 ± 7.8	<0.001 <sup>b</sup>
Response interval (min)	3.9 ± 2.0	3.8 ± 1.9	0.871
On-scene interval (min)	9.8 ± 4.5	17.0 ± 7.1	<0.001 <sup>b</sup>
Transport interval (min)	4.7 ± 2.5	4.2 ± 2.6	0.376
Defibrillation for VF/VT	9 (10.7)	4 (13.3)	0.741
ETT/LMA insertion	0 (0.0)	18 (60.0)	<0.001 <sup>b</sup>
Intravenous access	0 (0.0)	15 (50.0)	<0.001 <sup>b</sup>
Intravenous epinephrine administration	0 (0.0)	8 (26.7)	<0.001 <sup>b</sup>
VF/VT on arrival ED	11 (13.1)	4 (13.3)	1.000
Blood pH on arrival ED	6.99 ± 0.22	6.98 ± 0.22	0.871
ROSC at ED	45 (53.6)	9 (30.0)	0.026 <sup>b</sup>
Admission to ICU	32 (38.1)	6 (20.0)	0.071
Survive to hospital discharge	10 (11.9)	2 (6.7)	0.729
Presumed cardiac etiology	35 (41.7)	12 (40.0)	0.874

ALS = advanced life support; BLS = basic life support; ED = emergency department; ETT = endotracheal tube; ICU = intensive care unit; LMA = laryngeal mask airway; ROSC = return of spontaneous circulation; VF/VT = ventricular fibrillation/ventricular tachycardia.

<sup>a</sup> Data are presented as mean ± standard deviation or *n* (%).

<sup>b</sup> Statistically significant.

time-intensive procedures would interrupt CPR and prolong the prehospital intervals; in addition, overemphasizing these procedures might compromise the CPR’s quality. Furthermore, because prehospital resources were poorer than those in emergency departments, we supposed that a long prehospital interval would contribute to poor outcomes.

Our small study revealed that BLS was no worse than ALS for resuscitating OHCA patients. We suggest that good-quality CPR and rapid transport of OHCA patients play central roles in saving these patients.

### References

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<sup>†</sup> All contributing authors declare no conflict of interest.

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