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Clinical paper

Cardiopulmonary resuscitation outcome of out-of-hospital cardiac arrest in low-volume versus high-volume emergency departments: An observational study and propensity score matching analysis  $\hat{\sim}\dagger$

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### Abstract

#### Objective

This study aimed to determine whether cardiopulmonary resuscitation (CPR) volume is associated with survival to discharge rate for out-of hospital cardiac arrest (OHCA) victims.

#### Methods

This study was performed in an emergency medical service (EMS) system with single-tiered basic to intermediate service level. A nationwide OHCA cohort database from January 2006 to December 2007 was used and composed of hospital chart review and ambulance run sheet data. We enrolled data from the 410 emergency departments and excluded cases without available hospital outcome data. From sensitivity analysis, we decided cut-off value for the high volume (HV) versus low volume (LV) EDs. A matching process based on propensity score was used to equalize potential prognostic factors in both groups. The adjusted odds ratio (OR) and its 95% confidence interval (95% CI) for survival to admission and to discharge were calculated.

## Results

Of the 34,408 patients with OHCA, 20,457 (59.5%) were included except cases with unknown outcome ( $n = 1284$ ), traumatic cause ( $n = 4894$ ), no CPR attempt by EMS ( $n = 7779$ ), and cases transferred to non-ED facilities ( $n = 3885$ ). Overall survival to admission and to discharge was 10.9% and 3.4%, respectively. When we performed the sensitivity analysis for deciding the cut-off value for HV versus LV, the number was 68 per two years (sensitivity 67.0%, specificity 67.0%). Using propensity score matching, 3533 cases were randomly assigned to HV and LV group, respectively. The unadjusted and adjusted OR for survival to admission in HV was 1.35 (95% CI 1.19–1.54) and 1.44 (95% CI 1.24–1.66), respectively. The unadjusted and adjusted OR for survival to discharge was 1.71 (95% CI 1.36–2.14) and 1.81 (95% 1.43–2.30), respectively.

## Conclusions

Emergency departments with high volumes of CPR cases showed significantly better outcomes for OHCA patients than those with low volumes in an EMS system with single-tiered basic to intermediate service level.



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## Keywords

Cardiac arrest; Resuscitation; Hospital volume; Outcome

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A Spanish translated version of the abstract of this article appears as Appendix in the final online version at [doi:10.1016/j.resuscitation.2010.08.031](https://doi.org/10.1016/j.resuscitation.2010.08.031).

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