The factors predicting early extubation after targeted temperature management for out of hospital cardiac arrest patients

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Abstract

Out of hospital cardiac arrest patients treated with targeted temperature management may have substantial difficulty in extubation due to multiple organ failure. However, predictive factors of extubation after targeted temperature management remain unclear. We hypothesized that time required for extubation after targeted temperature management is determined by prehospital care and predicted by examinations in emergency department. The purpose of this study was to examine what factors predict early extubation after targeted temperature management.

We performed a retrospective cohort study of out of hospital cardiac arrest patients brought to the emergency room at St. Luke's International Hospital in Tokyo, Japan, between January 2006 and July 2015. We included patients who collapsed out-of-hospital due to a cardiogenic cause, and completed targeted temperature management after return of spontaneous circulation. Primary outcome is the number of days to extubation from admission to the intensive care unit. Using the electronic medical record, we collected data about patient characteristics, prehospital care, and examination in emergency department. Setting tracheostomy cases and in-hospital death cases with intubation as competing risks, the causal relationship between resuscitation condition and primary outcome were assessed with Fine and Gray model analysis.

Of 209 out of hospital cardiac arrest patients who received targeted temperature management during this period, 114 patients completed targeted temperature management with the targeted temperature of 34.0±0.5 °C. After one patient was excluded, there remained 113 eligible patients: 76 patients were extubated, 31 received tracheostomy, and five died in-hospital while being intubated without a tracheostomy. The results of the Fine and Gray model multivariate analysis found that these variables had significant differences: younger age (95% CI of hazard ratio, 0.94 - 0.97); existence of bystander CPR (95% CI of hazard ratio, 1.13 - 3.23); short time to ROSC (95% CI of hazard ratio, 0.94 - 0.99); existence of motor response in ED (95% CI of hazard ratio, 1.37 - 3.94). Prehospital care and examinations on admission can predict early extubation after targeted temperature management. Therefore, this result can be helpful in clinical decision making around targeted temperature management.

Keywords: targeted temperature management, extubation