

Early neuro-prognostication with the Patient State Index and suppression ratio in post-cardiac arrest patients

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Purpose

Cardiopulmonary resuscitation guidelines recommend multimodal neuro-prognostication after cardiac arrest using neurological examination, electroencephalography, biomarkers, and brain imaging. The Patient State Index (PSI) and suppression ratio (SR) represent the depth and degree of sedation, respectively. We evaluated the predictive ability of PSI and SR for neuro-prognostication of post-cardiac arrest patients who underwent targeted temperature management.

Methods

This prospective observational study was conducted between January 2017 and August 2020 and enrolled adult patients in an intensive care unit (ICU) with non-traumatic out-of-hospital cardiac arrest with return of spontaneous circulation (ROSC). PSI and SR were monitored continuously during ICU stay, and their maximum, mean, and minimum cutoff values 24 h after ROSC were analyzed to predict poor neurologic outcome and long-term survival.

Results

The final analysis included 103 patients. A mean PSI ≤ 14.53 and mean SR > 36.6 showed high diagnostic accuracy as single prognostic factors. Multimodal prediction using the mean PSI and mean SR showed the highest area-under-the-curve value of 0.965 (95% confidence interval 0.909–0.991). Patients with mean PSI ≤ 14.53 and mean SR > 36.6 had relatively higher long-term mortality rates than those of patients with values >14.53 and ≤ 36.6 , respectively.

Conclusions

The PSI and SR are good predictors for early neuro-prognostication in post-cardiac arrest patients.