

Epileptiform discharge detection with the 4-channel frontal electroencephalography during post-resuscitation care.

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INTRODUCTION: We performed this study to investigate whether the SEDline system, a 4-channel-processed electroencephalography (EEG) monitoring device in the frontal area, can detect epileptiform discharges accurately during post-resuscitation care in comatose cardiac arrest survivors.

METHODS: Adult comatose cardiac arrest survivors, who were admitted to the intensive care unit (ICU) for post-resuscitation care including TTM, were enrolled. Within 72h post-return of spontaneous circulation (ROSC), conventional EEG was conducted for 30min. The SEDline system data were recorded with a video camera simultaneously with conventional EEG. Data retrieved from conventional EEG were interpreted by a neurologist and data from the SEDline system were interpreted by three emergency physicians blinded to the conventional EEG data. Then, the sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy of the SEDline system to detect epileptiform discharges were calculated.

RESULTS: Thirty-nine patients were enrolled in this study. Epileptiform discharges were confirmed in 6 patients (15.4%) who had the same patterns of generalized periodic epileptiform discharges in both conventional EEG and the concurrent SEDline system. The SEDline system showed 100.0% (95% confidence interval (CI), 54.1-100.0%) of sensitivity, 100.0% (95% CI, 89.4-100.0%) of specificity, 100.0% (95% CI, 54.1-100.0%) of PPV, and 100.0% (95% CI, 89.4-100.0%) of NPV. The overall classification accuracy of the SEDline system to detect epileptiform discharges was 100.0%.

CONCLUSION: The SEDline system detected epileptiform discharges accurately in comatose cardiac arrest survivors during post-resuscitation care.