Introduction:
Raw simplified EEG tracings obtained by a bispectral index (BIS) device significantly correlate with standard EEG [1]. This study aimed to investigate whether simplified BIS EEG tracings can predict poor neurologic outcome after cardiac arrest (CA).

Methods:
Bilateral BIS monitoring (BIS VISTATM, Aspect Medical Systems, Inc. Norwood, USA) was started following ICU admission. Six, 12, 18, 24, 36 and 48hrs after targeted temperature management (TTM) at 33°C was started, raw simplified BIS EEG tracings were extracted and reviewed by two neurophysiologists for the presence of burst suppression, cerebral inactivity and epileptic activity. At 180 days post-CA, neurologic outcome was determined using the CPC scale, where a CPC1-2 and CPC3-5 corresponded to good and poor neurologic outcome, respectively.

Results:
Of the 75 enrolled CA-patients enrolled, 40 had good and 35 poor neurologic outcome. With a positive predictive value (PPV) of 1.000 and a negative predictive value (NPV) of 0.606, epileptic activity within 6-12hrs predicted a CPC3-5 with the highest accuracy. Epileptic activity within time frames 18-24hrs and 36-48hrs showed a PPV for poor outcome of 0.917 and 0.938, respectively. Cerebral inactivity within 6-12hrs had a poor predictive power (PPV=0.545, NPV=0.566). In contrast, cerebral inactivity between 36-48hrs predicted a CPC3-5 with a PPV of 1.000 and a NPV of 0.597. The pattern with the worst predictive power at any time point was burst suppression with a PPV of 0.363, 0.529 and 0.500 at 6-12hrs, at 18-24hrs and at 36-48hrs, respectively.

Conclusion:
Based on simplified EEG derived from a BIS device, both the presence of epileptic activity at any time as well as cerebral inactivity after the end of TTM can be used to assist with poor outcome prognostication in successfully resuscitated CA patients.

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