Brain injury after cardiac arrest – the predictive information of EEG
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**Background:** Many of cardiac arrest patients treated at an intensive care unit will die, mostly after a decision of withdrawal of care due to a prognostication of severe hypoxic brain damage. The decision is based on clinical examination in combination with other prognostic methods, where EEG is the most widely used. EEG can show the recovery of normal brain activity or appearance of different pathological patterns. However, international consensus is still lacking on how EEG interpretation should be done to become a reliable prognostic tool.

**Aim/Methods:** To evaluate and identify standardized EEG methods for reliable prognostication of post arrest brain damage.

Paper 1 and 2 are based on continuous EEG recordings from the intensive care unit at Skane University hospital in Lund. We compared characteristics of patients with and without electrographic status epilepticus. We also described the survivors and patients who died or developed severe neurological sequelae. EEG were analyzed based on the standardized definitions from the American Clinical Neurophysiology Society. The group of patients with definitive electrographic status epilepticus was compared to the group with a borderline electrographic status epilepticus pattern.

Paper 3 and 4 will be based on routine EEGs from the prospective multicenter TTM-trial. Our pilot study proposed that highly malignant EEG patterns strongly correlate to poor prognosis. In Paper 3 we will evaluate the correlation of these patterns to outcome in the larger cohort. In Paper 4 we will compare simplified EEG electrode montage with full montage EEG to evaluate if the methods are comparable for prognostication.

**Results:** In Paper 1 and 2 we showed that post arrest status epilepticus is common and only has few survivors. Nevertheless, a differentiation into a strict or a more liberal EEG definition of status epilepticus had no correlation to outcome or clinical characteristics. Other signs such as early recovery of a continuous EEG background could be of more importance for outcome.

**Conclusion:** With knowledge of the significance of different EEG patterns, a safer and earlier prognostication can be done.

**Publications:**