

Setting up a neurological prognostication service in a tertiary cardiac centre with no neurophysiological support on-site

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Aims

Brain injury is the most common cause of mortality after return of spontaneous circulation following out of hospital cardiac arrest. European guidelines suggest a multimodal approach to neurological prognostication because of the difficulties associated with sedation, paralysing agents and mild therapeutic hypothermia used in post-cardiac arrest care. Effective prognostication is imperative for the clinician for better planning of care, as well as providing realistic survival chances for families. The use of neurophysiology as part of a multimodal approach is underutilised within the UK, especially in centres with no neurophysiology department on-site.

Our aim was to test the feasibility and safety of setting up a neurological prognostication service in a tertiary cardiothoracic centre without on-site neurophysiological support, to improve post-cardiac care on the intensive care unit (ICU).

Methods

Following training from external hospitals, as well as on-site training from a visiting healthcare scientist, from February – August 2017, the research team recorded electroencephalogram (EEG) and somatosensory evoked potential (SSEP) at several points during a patient's stay from admission to the ICU to 72 hours after. Recordings were suspended if a patient awoke. These were sent securely to an external core lab for interpretation and quality analysis. The quality and safety of the service was assessed to test the feasibility of implementing this service into standard care. To ensure safety of patients, results/recordings were blinded to all staff involved in the clinical decision making of the patients.

Results

Thirty patients were enrolled during the research period with a 70% survival to discharge rate. Around 95% of all recordings were performed adhering to the protocol with 98% deemed as quality as confirmed via an experienced off-site neurophysiologist. These

were quality assessed for interference as well as progression/deterioration of patients, malignant EEG/SSEP and normal waveforms. All patients had at least one interpretable EEG/SSEP that we envisage will aid prognostication for the clinician and care for patients in the future.

Conclusion

ICU staff can be trained in recording complex EEG and SSEP while implementing internal quality control without an on-site neurophysiology department, and then securely sent to external core labs for analysis. We believe that our results show that a neurophysiology service can be safely implemented as part of a post-cardiac arrest pathway of care to improve prognostication on the ICU, which can be implemented in all cardiac centres across the UK, including those without support on-site, which is vital for improving the care of cardiac arrest patients. ■

Conflict of interest statement

There are no conflicts of interest to declare.

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