Comparison of Detection Rates of Non-convulsive Status Epilepticus or Non-convulsive Seizure in Critically Ill Patients Using Routine EEG and Continuous EEG in a Busy County and a Private Hospital

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Background

• Continuous EEG (CEEG) monitoring is primarily performed to detect non-convulsive seizures (NCS) and non-convulsive status-epilepticus (NCSE).

• Use of CEEG is rapidly expanding and becoming standard of care in the intensive care units (ICU).

• NCS and NCSE are associated with poor outcomes, independent of etiology.

• NCS/NCSE duration and time to diagnosis are predictors of outcome. In one study, when NCSE was diagnosed within 30 minutes the mortality was 36%, whereas if the diagnosis was delayed over 24 hours the mortality increased to 75%.

• Some studies recommend continuing CEEG for at least 24 hours before NCS/NCSE can be excluded.

• There are many centers around the country without CEEG capabilities, as CEEG demands intensive technical and interpretative labor. In this study, we compare the detection rate of NCS/NCSE in a busy county hospital without CEEG capabilities and a private hospital using CEEG monitoring.

Methods

• We retrospectively reviewed the medical records of patients 18 years or older from January 2008 to June 2009 who had a routine EEG (REEG) for a suspicion of NCS/NCSE in medical, surgical, neurological or neurosurgical ICUs, and cardiac care unit (CCU) at Ben Taub General Hospital (BTGH), Houston, TX. BTGH is a busy hospital as part of Harris County Hospital District and currently does not have CEEG capabilities.

• For the same period, medical records of patients at ICU or CCU settings at St. Luke's Episcopal Hospital (SLEH), Houston, TX who had a REEG or CEEG were reviewed.

Results

• During the study period, 286 REEGs were performed at BTGH with detection of 4 cases of NCS/NCSE (1.4%).

• For the same period of time, 308 REEGs were performed at SLEH with detection of 2 cases of NCS/NCSE (0.6%).

• Although the population base of the two hospitals are significantly different, the rate of detection of NCS/NCSE by REEG was not significantly different between the two (p=0.435).

• During the same period, 85 CEEGs were performed at SLEH with detection of 11 cases of NCSE/NCS (12.9%).

• Comparison of CEEG to REEG at SLEH revealed a marked increase in the detection rate of NCS/NCSE by the former method ($p < 0.0001$).

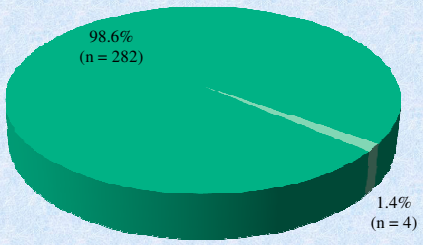
• Similarly, comparison of CEEG to combined REEGs at SLEH and BTGH revealed increased rate in detection of NCS/NCSE ($p < 0.0001$).

Conclusion

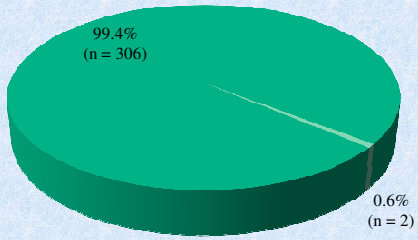
• Although REEG remains a useful tool in the diagnostic evaluation of encephalopathy in the ICU settings and should be routinely employed in centers without CEEG capabilities, CEEG is ideal for detection of NCS/NCSE.

Authors have nothing to disclose

Detection rate of NCS/NCSE by REEG at BTGH



Detection rate of NCS/NCSE by REEG at SLEH



Detection rate of NCS/NCSE by CEEG at SLEH