

## Bedside reduced lead electroencephalography can be used to make the diagnosis of nonconvulsive status epilepticus in the Emergency department

J. Brenner<sup>1</sup>, P. Kent<sup>2</sup>, S. Wojcik<sup>1</sup> and W. Grant<sup>1</sup>

<sup>1</sup>Emergency Medicine, <sup>2</sup>Neurology, SUNY-Upstate Medical University, USA

**Objectives:** Electroencephalography (EEG) is indicated for diagnosing nonconvulsive status epilepticus in a patient who has altered level of consciousness (ALOC) after a motor seizure. A study in a neonatal population found 94% sensitivity and 78% specificity for detection of seizure using a single-lead device. This study aims to show that a reduced montage EEG would detect 90% of seizures detected on standard EEG.

**Methods:** A portable Brainmaster EEG device was available in the ED at all times. The indication for enrollment into the study was ALOC with a known history of seizures. The ED physician obtained informed consent from the legally authorized representative (LAR), while an ED technician attached the electrodes to the patient, and a research associate attached the electrodes to the wiring routing to the portable EEG module. A Board-Certified Epileptologist interpreted the tracings via the Internet. Simultaneously, the ED physician ordered a standard 23-lead EEG, which would be interpreted by the neurologist on-call to read EEGs. The epileptologist's interpretation of the reduced montage EEG was compared to the results of the 23-lead EEG, which was considered the gold standard for detecting seizures.

**Results:** 12 of 12 patients or 100% had the same findings on reduced montage EEG as standard EEG. 1 of 12 patients or 8% had nonconvulsive seizure activity.

**Conclusion:** The results are consistent with prior studies which have shown that 8-25% of patient who have had a motor seizure continue to have nonconvulsive seizure activity on EEG. This study shows that a bedside reduced-montage EEG can be used to make the diagnosis of nonconvulsive status epilepticus (NCSE) in the emergency department. Further study will be conducted to see if this technology can be applied to the inpatient neurological intensive care unit setting.

### Biography

Jay Brenner is an Assistant Professor in the Department of Emergency Medicine at SUNY-Upstate Medical University in Syracuse, NY. He practices clinically at Upstate University Hospital and Upstate University Hospital at Community General in Syracuse, where he serves as the Assistant Medical Director of Emergency Services. He teaches the principles of Emergency Medicine to students, residents, and fellows at the bedside and in didactic lectures. He is elected to the Board of Directors of the New York chapter of the American College of Emergency Physicians. His interest in bedside EEG research inspired collaboration with Syracuse University biomedical engineering students and has evolved into a passionate search for a better way to care for patients suffering from seizures, especially in the Emergency Department setting.

brennerj@upstate.edu