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Bedside reduced lead Electroencephalography can be used to make the diagnosis of Nonconvulsive Status Epilepticus in the Emergency Departments

Jay Brenner, Paul Kent, Susan Wojcik and William Grant

SUNY-Upstate Medical University, USA

Electroencephalography (EEG) is indicated for diagnosing nonconvulsive status epilepticus (NCSE) in patients with altered level of consciousness (ALOC) after a motor seizure. In a neonatal population a single-lead device had 94% sensitivity and 78% specificity for detection of seizure. This study aimed to show that a reduced montage EEG would detect 90% of seizures detected on standard EEG. A portable Brainmaster EEG device was available utilitzed to obtain the study EEG. The indication for enrollment into the study was ALOC with a known history of seizures. Informed consent was obtained initially from the legally authorized representative. A Board-Certified Epileptologist interpreted the tracings via the Internet. Simultaneously, the emergency department (ED) physician ordered a standard 23-lead EEG, which would be interpreted by the neurologist on-call to read EEGs. The epileptoglogist'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. 12 of 12 patients or 100% had the same findings on reduced montage EEG as standard EEG. 1 of 12 patients or 8% had nonculsive seizure activity. The results were 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 showed that a bedside reduced-montage EEG can be used to make the diagnosis of NCSE in the ED. Further study will be conducted to see if this technology can be applied in the inpatient neurololgical intensive care setting.

Biography

Jay Brenner is an Assistant Professor in the Department of Emergency Medicine at SUNY-Upstate Medical University in Syracuse, NY. He is the Assistant Medical Director of Emergency Services at University Hospital at Community General and serves on the Board of Directors of the New York chapter of the American College of Emergency Physicians. He enjoys teaching the principles of Emergency Medicine at the bedside and in didactic lectures. 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 these patients in the Emergency Department.

brennerj@upstate.edu