Medical Xpress

New findings encourage more vigilant monitoring of seizure activity among intensive care patients

June 17 2009

Two new studies published by neurologists at Columbia University Medical Center and NewYork-Presbyterian Hospital demonstrate a need for more vigilant monitoring for seizure activity among intensive care patients who may be experiencing subtle seizures that are typically unrecognized. These subtle seizures may be affecting patients' prognoses and causing long-term brain damage, death and severe disability.

Published in recent issues of the *Annals of Neurology* and *Critical Care Medicine*, both studies were led by Lawrence J. Hirsch, M.D., associate clinical professor of neurology, Columbia University Medical Center, and director of the Continuous EEG Monitoring Program at the Comprehensive Epilepsy Center at NewYork-Presbyterian Hospital/Columbia. His group, in conjunction with Drs. Stephan Mayer and Jan Claassen of the Neurological Intensive Care Unit (NICU) at NewYork-Presbyterian Hospital/Columbia, has previously shown that unrecognized seizures are common in the critically ill, particularly in those with acute brain injury, and that these seizures are associated with unfavorable outcomes. NewYork-Presbyterian/Columbia's Continuous EEG Monitoring Program is one of the largest and most academically productive in the world.

The two studies found that electroencephalography was effective in detecting subtle seizures that are often impossible to detect by visual observation. Findings demonstrated the value of continuous EEG (where

electrodes are placed on the scalp - a noninvasive procedure used in nonsurgical ICUs) and intracranial EEG (ICE), an invasive technology where a probe is placed in the cortex of the patient's brain. ICE is mainly used in Neurological ICUs for serious acute brain injuries, such as subarachnoid hemorrhage, severe head trauma and very large strokes (hemorrhagic or ischemic), which require other invasive brain monitoring devices.

"Monitoring for seizure activity in intensive care patients is important in order to identify small, clinically invisible seizures, which might explain why patients are not waking up - namely, because they are having lots of mini-seizures in multiple locations. Treating these clinically silent seizures may lead to improved alertness, reverse ongoing brain dysfunction, and prevent progressive injury to brain cells," says Dr. Hirsch. "Intracortical electroencephalography (ICE) appears to be the preferred method to monitor seizure activity in patients requiring other invasive brain monitoring (standard in the NewYork-Presbyterian/Columbia Neurological ICU in many patients), as it provides better, real-time brain monitoring, while patients in the Medical ICU should receive continuous EEG monitoring with standard, noninvasive electrodes."

The *Annals of Neurology* paper, "Intracortical Electroencephalography in Acute Brain Injury," compares the use of standard scalp EEG monitoring in NICU patients with ICE monitoring. ICE was found to detect small seizures occurring within the patient's brain that the continuous EEG could not detect. ICE was also helpful in detecting ischemia (inadequate blood flow) and bleeding as soon as they occurred, and prior to detection by clinical exam or other monitoring methods. Dr. Allen Waziri, NewYork-Presbyterian/Columbia, was the first author.

The *Critical Care Medicine* paper, "Continuous Electroencephalography in the Medical Intensive Care Unit," examines continuous EEG

monitoring in the Medical ICU (MICU) in patients with no known primary brain abnormality. Using continuous EEG monitoring, Dr. Hirsch and his research team found that seizures, and nearly continuous "spikes" that are related to seizures, were common among patients in the MICU, especially patients with sepsis (a serious systemic infection). The majority of seizures were non-convulsive, meaning that they were not visible to an observer and could only be detected by continuous EEG. These abnormal brain wave patterns were strongly associated with death and severe disability. This may help explain the enigmatic condition of sepsis-associated encephalopathy, in which patients with systemic infections become delirious or stuporous. Dr. Mauro Oddo, a medical intensivist visiting from Switzerland, was first author on the study.

"Treating certain ICU patients with anti-seizure medications might help prevent neuronal damage, reduce length of stay in the ICU and help patients wake-up sooner," says Dr. Hirsch. "Additional research is needed to determine the exact prevalence and impact of seizures and related EEG patterns on patient outcome, particularly in patients with sepsis, and to evaluate whether their prevention will improve outcomes. We are beginning some of these studies now."

Source: Columbia University Medical Center (news : web)

Citation: New findings encourage more vigilant monitoring of seizure activity among intensive care patients (2009, June 17) retrieved 8 May 2024 from https://medicalxpress.com/news/2009-06-vigilant-seizure-intensive-patients.html