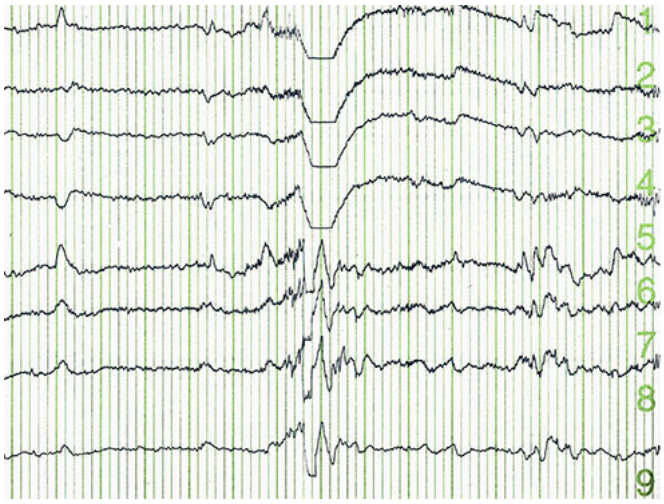
Study finds EEG biomarker to predict seizure onset in tuberous sclerosis patients

3 November 2015, by Bob Shepard



A multicenter study led by the University of Alabama at Birmingham has found a biomarker identified via electroencephalography, or EEG, that is 100 percent predictive for seizures in infants with tuberous sclerosis complex. TSC is a genetic disorder that causes nonmalignant tumors to form in many different organs, primarily in the brain, eyes, heart, kidney, skin and lungs. The study is published online in Pediatric Neurology.

Approximately 80 percent of TSC patients develop seizures between birth and age 3. The new EEG biomarker, the first of its kind in TSC patients, presents as an abnormality in the EEG called an epileptiform discharge. In the study, all infants with the biomarker developed seizures within two to three months.

"The earlier seizures are recognized and treated, the better the developmental outcomes for children with TS," said E. Martina Bebin, M.D., professor in the Department of Neurology at UAB and the study's senior author. "The development of this predictive biomarker may provide a critical window of opportunity for families and medical providers to initiate treatment at seizure onset, with potentially a positive impact on the infant's developmental outcome."

The study, conducted at five medical centers across the United States, examined 40 children with a diagnosis of TSC.

The presence of the biomarker means families will need to learn the identifying signs of seizures and begin to involve a neurologist in their child's care prior to actual seizure onset. Bebin says the study reinforces the idea that EEG should be done at time of diagnosis for TSC, and repeated on a regular basis. The study conducted EEG every six weeks.

"The results of this study not only support the importance of that initial EEG but also the importance of subsequent EEGs in monitoring the development of seizures and epileptiform discharges," Bebin said. "Our study demonstrates the feasibility and importance of close EEG surveillance in infants with TSC for predicting those who will subsequently develop epilepsy."

Bebin says further studies are needed to better understand the relationship between various therapeutic agents and the biomarker, along with determination of the optimal timeframe in which to begin therapy.

Tuberous sclerosis complex is an autosomal dominant disease that affects approximately one in 6,000 people and is one of the most common genetic causes of epilepsy. Almost half of infants with TSC develop epilepticspasms, which is associated with poor neurological prognosis.

More information: Joyce Y. Wu et al, Clinical Electroencephalographic Biomarker for Impending Epilepsy in Asymptomatic Tuberous Sclerosis

Complex Infants, *Pediatric Neurology* (2015). DOI: 10.1016/j.pediatrneurol.2015.09.013