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Researchers from the UK determined that developmental delays are present in children within six weeks following convulsive status epilepticus (CSE)—a seizure lasting longer than thirty minutes. The study appearing today in *Epilepsia*, a journal published by Wiley on behalf of the International League Against Epilepsy (ILAE), suggests that neurodevelopmental impairments continue to be present one year after CSE.

CSE is one of the most common neurological emergencies in children. These prolonged seizures can occur with or without fevers (febrile). Studies show that CSE occurs more frequently during the first three years of life—a time of critical growth and development in children. Prior research investigating CSE has focused mainly on simple febrile seizures and was conducted years after the event occurred.

"Our study is the first to examine cognitive, language, and motor function in children

within six weeks of CSE, with follow-up at one year to determine their developmental track," said lead author, Dr. Marina Martinos with the Developmental Cognitive Neurosciences Unit at UCL Institute of Child Health in London. "Understanding how CSE impacts early childhood development and whether this type of seizure has long-term adverse affects is an important addition to medical evidence."

For the present study, researchers recruited 54 children between one and forty-two months of age who had at least one CSE event. CSE episodes were classified as prolonged febrile seizures (PFS) or nonfebrile CSE. All pediatric participants underwent neuropsychological assessments and imaging scans within six weeks of the CSE event and at one year. Developmental skills were measured in children who had

seizures and compared to children without seizures with normal development.

Half of the pediatric participants had PFS and the other half had nonfebrile CSE, with assessments carried out at a mean of 38 days following CSE. Findings indicate that CSE is linked to developmental impairments within six weeks of the event, and that the impairments persisted at the one-year follow-up. Children with nonfebrile PFS had worse developmental outcomes than those with PFS, and children in the PFS group had poorer developmental skills than those in the control group. The authors found that seizure characteristics (e.g. duration) were not a significant predictor of developmental performance.

Dr. Martinos concludes, “We found developmental impairments in children following CSE, including those with PFS who normally do not display neurologic issues prior to the seizure. The fact that neurodevelopmental impairments are still present at one year after the episode suggests that the CSE event is not having just a transient effect on developmental abilities. The CSE may have a longer lasting impact on future development through a more permanent reorganization of functional brain networks – a reorganization that may have already taken place when we first assess these children.”

Alternatively, the authors comment, these data suggest that the neurodevelopmental impairments observed predate the seizure even in those with no neurological priors.

The authors propose that further studies that include neurocognitive techniques are necessary to enhance understanding of the long-term impact of CSE on child development.