Aging accelerates brain abnormalities in childhood onset epilepsy patients

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New research confirms that childhood onset temporal lobe epilepsy has a significant impact on brain aging. Study findings published in *Epilepsia*, a peer-reviewed journal of the International League Against Epilepsy (ILAE), show age-accelerated ventricular expansion outside the normal range in this patient population.

According to the Centers for Disease Control and Prevention (CDC), epilepsy affects nearly 2 million Americans. Temporal lobe epilepsy is the most common form of partial epilepsy, with 60% of all patients having this form of the disease. Previous evidence suggests that patients with childhood onset epilepsy have significant cognitive and developmental deficiencies, which continue into adulthood, particularly in those resistant to antiepileptic drugs.

Prior imaging studies of patients with temporal lobe epilepsy have shown abnormalities in brain structure in hippocampus, in thalamus and other subcortical structures, and also in cortical and white matter volume. However, there is limited knowledge of the effects of aging on these structural changes.

To characterize differences in brain structure and patterns of age-related change, Dr. Bruce Hermann and colleagues from the University of Wisconsin-Madison recruited 55 patients with chronic temporal lobe epilepsy and 53 healthy controls for their study. Participants were between the ages of 14 and 60, with patients having mean age of onset of epilepsy in childhood/adolescence. Magnetic resonance imaging (MRI)

was used to measure cortical thickness, area and volume in the brains of all subjects.

In participants with epilepsy, there were extensive abnormalities in brain structure, involving subcortical regions, cerebellum and cortical gray matter thickness and volume in the temporal and extratemporal lobes. Furthermore, researchers found that increasing chronological age was associated with progressive changes in cortical, subcortical and cerebellar regions for both epilepsy subjects and healthy controls. The pattern of change was similar for both groups, but epilepsy patients always showed more extensive abnormalities. In particular, epilepsy patients displayed age-accelerated expansion of the lateral and third ventricles. "The anatomic abnormalities in patients with epilepsy indicate a significant neurodevelopmental impact," said Dr. Hermann.

"Patients with epilepsy are burdened with significant neurodevelopmental challenges due to these cumulative brain abnormalities," concludes Dr. Hermann. "The consequences of these anatomical changes for epilepsy patients as they progress into elder years remain unknown and further study of the adverse effects in those of older chronological age is needed."

More information: "Brain Structure and Aging in Chronic Temporal Lobe Epilepsy." Kevin Dabbs, Tara Becker, Jana Jones, Paul Rutecki, Michael Seidenberg, and Bruce Hermann. Epilepsia; April 2, 2012 (DOI:10.1111/j.1528-1167.2012.03447.x).

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