

FRONTAL LOBE CONNECTIVITY AND COGNITIVE IMPAIRMENT IN FRONTAL LOBE EPILEPSY

Investigators at Maastricht University Medical Center, and Epilepsy Center Kempenhaeghe, The Netherlands, using functional magnetic resonance imaging (fMRI), studied the relationship between brain activation, functional connectivity, and cognitive functioning in 32 children aged 8-13 years with frontal lobe epilepsy (FLE) and 41 healthy age-matched controls. For the task-related fMRI, a Sternberg letter recognition task was used to induce cerebral activation, reflecting verbal working memory performance. Cognition was impaired in 16 children with FLE (50%) and in 3 healthy controls (7%). During working memory task performance, children with FLE showed a global decrease in functional brain connectivity compared to controls, whereas brain activation patterns remained intact. The widespread decrease in functional brain connectivity was similar in cognitively impaired and unimpaired patients. The decrease in frontal lobe connectivity in children with FLE complicated by cognitive impairment affected both connections within the frontal lobe and those from frontal to parietal and temporal lobes, cerebellum, and basal ganglia. The decrease in functional brain connectivity appeared to be related to the epilepsy itself, and was independent of cognitive performance.

The seizure types in this cohort of FLE patients were complex partial in 6 (19%), atypical absence in 13 (41%), and secondary generalized tonic-clonic in 5 (15%). The seizure focus based on EEG and history was bifrontal in 17 (53), left frontal in 8 (25%) and right frontal in 7 (22%). A history of febrile seizures was elicited in 9 (28%) and status epilepticus in 2 (6%). Seizures were refractory in 21 (66%). (Braakman HMH, Vaessen MJ, Jansen JFA, et al. Frontal lobe connectivity and cognitive impairment in pediatric frontal lobe epilepsy. *Epilepsia* 2013 Mar;54(3):446-54). (Response: Dr Hilde MH Braakman, Department of Neurology, Maastricht University Medical Center, The Netherlands. E-mail: hilde.braakman@gmail.com).

COMMENT. Impairment of functional integrity of the frontal lobe network in children with FLE extends to connections to temporo-parietal lobes, cerebellum and basal ganglia. The relation between these altered functional networks and cognition in FLE is unexplained. The authors refer to a literature review of pediatric FLE and to functional connectivity studies in adult patients with mesial temporal lobe epilepsy showing altered connectivity in network structures distant from the seizure focus (Waites AB et al. *Ann Neurol* 2006 Feb;59(2):335-43). (Braakman HMH, et al. Cognitive and behavioral complications of frontal lobe epilepsy in children: a review of the literature. *Epilepsia* 2011 May;52(5):849-56).

POPULATION-BASED STUDY OF EPILEPSY IN INFANTS

Investigators at the Paediatric Neurology Department, Great Ormond Street Hospital for Children, London, and other centers in the UK and USA carried out a population-based study of children, 1-24 months of age, with new-onset epilepsy, ascertained over 13 months from 15 boroughs of North London. A total of 57 children were enrolled, an incidence of 70.1/100,000 children <2 years of age/year; 23 (41%) were