

THE MASQUERADES OF TEMPORAL LOBE EPILEPSY IN CHILDHOOD

Age-Dependent Seizure Semiology in Temporal Lobe Epilepsy. Fogarasi A, Tuxhorn I, Janszky J, Janszky I, Rásonyi G, Kelemen A, Halász P. *Epilepsia* 2007;48(9):1697–1702. Epub 2007 May 23. **OBJECTIVE:** To examine the effects of age on different aspects of temporal lobe seizure semiology. **METHODS:** We performed a video analysis of 605 archived seizures from 155 consecutive patients (age 10 months to 49 years) selected by seizure freedom after temporal lobectomy. Eighty patients had hippocampal sclerosis (HS). Beside semiological seizure classification, we assessed age dependency of several axes of seizure semiology: (1) aura, (2) number of different lateralizing signs, occurrence of ictal (3) emotional signs, (4) autonomic symptoms, (5) automatisms, and (6) secondary generalization as well as (7) the ratio of motor seizure components. **RESULTS:** From the 155 patients, 117 reported aura, 39 had ictal emotional signs, 51 had autonomic symptoms, 130 presented automatisms, while 18 patients showed secondary generalization at least once during their seizures. Altogether 369 (median: 2/patient) different lateralizing signs were recorded. Frequency of HS ($p < 0.001$), ictal automatisms ($p < 0.001$), secondary generalization ($p = 0.014$), number of different lateralizing signs ($p < 0.001$) increased while the ratio of motor seizure component ($p = 0.007$) decreased by age. Auras, emotional symptoms, and autonomic signs occurred independently of patients' ages. Hippocampal sclerosis adjusted linear models revealed that the frequency of automatisms and secondarily generalized seizures as well as the number of different lateralizing signs are HS-independent significant variables. **CONCLUSION:** Our findings support that brain maturation significantly influences the evolution of some important aspects (motor seizures, lateralizing signs) of temporal lobe seizure semiology. Conversely, other aspects (aura, emotional, and autonomic signs) are independent of the maturation process. This is the first report investigating age dependency of epileptic seizure semiology comparing all age groups.

COMMENTARY

Although over 70 percent of temporal lobe seizure disorders begin in childhood, early recognition is often impeded by

a nonspecific semiology, multifocal-interictal and widespread-ictal EEG phenomena, and an initial lack of characteristic MRI features (1–3). Previous studies had disclosed a higher incidence of motor features in children with temporal lobe epilepsy (TLE) than that reported in adults (4,5). This current, retrospective, cross-sectional study by Fogarasi and colleagues confirms these findings in a larger cohort and adds the unique feature of video

ictal analysis of children and adults with TLE. Unfortunately, only a longitudinal study will be able to determine whether and when the childhood semiology pattern found in these studies evolves to the more familiar adult pattern.

Several factors may contribute to the authors' finding of a greater incidence of motor phenomena in childhood than adult TLE. Lateral neocortical TLE occurs more commonly in children, whereas 90 percent of adult TLE originates mesially (2,6). Although the abundant mesial lateral temporal, reciprocal connections produce an ictal semiology principally shared by adults and children (7), clonic motor features and early ictal arm dystonia suggest a lateral temporal seizure origin (7,8). Prominent lateral temporal efferent fibers to the prefrontal cortex provide direct entry into the premotor cortex (9,10), while hippocampal efferent fibers through the subiculum project principally to the orbitofrontal and mesial frontal cortices (11). The greater incidence of extratemporal interictal spike foci in childhood TLE (3) may facilitate seizure propagation because such multiple foci may impair confinement of an epileptic discharge to a single region (12). Two additional factors that are characteristic of the immature brain with epilepsy may also promote ictal spread: 1) greater gap junction communication in immature brain (13) and 2) failure of the normal cortical pruning in the presence of epileptogenesis (14).

If the authors had categorized automatisms into oroalimentary and manual/gestural types they may have confirmed a predominance of the former in children less than 5 to 6 years of age and the latter in older subjects, as found in previous studies (15). The increasing incidence of secondarily generalized tonic-clonic seizures occurring with age found in the current article seems at variance with the higher motor seizure component ratio seen in young children. The possible effect of antiepileptic drug type and quantity on these findings is not stated.

The many factors involved in effectiveness of epilepsy surgery diminish somewhat the validity of postoperative seizure freedom in confirming seizure origin. Residual antiepileptic drugs, multiple seizure types, and limitation of surgical resection to spare significant functions are some of these factors. Additionally, a minimum follow-up period of 1 year (such as occurred in this study) is too short for a seizure localizing confirmatory role: seizures restarted 11 to 28 months after temporal lobectomy in 4 of 15 children in one study (16).

In summary, data from this study combined with earlier relevant works provide a valuable guide to the pediatric epileptologist. In a child with unexpectedly intractable focal seizures with prominent motor phenomena, multifocal EEG epileptiform activity, and a nondiagnostic MRI, TLE manifestations of a more mature brain may evolve as the brain matures. Valuable ictal lateralizing signs also may emerge over time, as Fogarasi and colleague's group ascertained. These ictal semiological changes

transpiring with increased age in childhood onset TLE thus far have received scant attention in major textbooks.

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