

## CLINICAL SIGNIFICANCE OF GENERALIZED SPIKE/WAVE EEG

The clinical correlates of 154 children with epilepsy and generalized spike-and-wave (SW) EEG patterns were analyzed at the pediatric neurology units, HU de Getafe and Hospital 12 de Octubre, Madrid, Spain. Mean age at seizure onset was 6 years (range, 0 - 14 years). Eighteen percent had learning disorders, and 14% had a history of febrile seizures. Ten percent of first-degree relatives had epilepsy. Absence seizures were the most frequent type at onset (36%); tonic-clonic seizures occurred in 27%, and complex partial seizures in 14%. More than 40% had several types of seizures at time of evaluation: 48% had at least one tonic-clonic, 46% absence, 20% complex partial. Epilepsy syndrome diagnoses included idiopathic generalized epilepsy (49%), and partial epilepsies (24%). The typical SW EEG pattern was usually associated with a single type of seizure, mainly idiopathic absence, normal neurologic exam and CT scan, no learning problems, and favorable outcome with monotherapy, sustained after drug withdrawal. Slow SW correlated with more than one type of seizure (atonic, myoclonic, tonic, and partial), West syndrome, psychomotor retardation, abnormal CT, polytherapy and poor seizure control. Fast SW occurred with partial and secondary generalized seizures, normal CT, and seizure recurrence after drug withdrawal. (Martinez-Menendez B, Sempere AP, Mayor P, et al. Generalized spike-and-wave patterns in children: clinical correlates. *Pediatr Neurol* Jan 2000; 22:23-28). (Respond: Dr Martinez-Menendez, U Neuropediatría, S Neurología, HU Getafe, Ctra de Toledo Km 12.400, 28905-Gefate, Madrid, Spain).

COMMENT. The typical SW EEG pattern associated with absence seizures has a much more benign outcome than the slow SW, usually associated with West and Lennox Gastaut syndromes. In contrast, the clinical course of children with the fast SW EEG is more difficult to predict, being associated with single isolated seizures and a tendency to seizure recurrence. Typical SW is 10 times more likely to correlate with seizure remission and successful drug withdrawal than the slow SW pattern.

## MECHANISM OF THE KETOGENIC DIET

To elucidate the possible significance of ketone bodies in the mechanism of the ketogenic diet, researchers at Washington University School of Medicine, St Louis, MO, examined the effect of B-hydroxybutyrate and acetoacetate on excitatory and inhibitory synaptic transmission and spontaneous seizures in rat hippocampal slices and cultured hippocampal neurons. Ketone bodies had no effect on synaptic transmission in these models, and the hypothesis that ketone production is involved in the anticonvulsant action of the diet was not substantiated. (Thio LL, Wong M, Yamada KA. Ketone bodies do not directly alter excitatory or inhibitory hippocampal synaptic transmission. *Neurology* January (2 of 2) 2000;54:325-331). (Reprints: Dr Kelvin A Yamada, Washington University School of Medicine, Department of Neurology, Box 8111, 660 S Euclid Ave, St Louis, MO 63310).

COMMENT. Stafstrom CE and Spencer S, in an editorial comment, suggest that further studies on the possible anticonvulsant effects of ketones should be conducted in animals of different ages and after chronic ketogenic diet treatment (*Neurology* Jan 2000;54:282-283). Perhaps further studies involving electrolyte changes induced by the diet would be more productive.

An electrolyte balance study in children with absence seizures treated with the ketogenic diet showed decreases in the blood pH, PCO<sub>2</sub>, and standard bicarbonate during ketosis (Millichap JG, Jones JD. Acid-base, electrolyte, and

amino acid metabolism in children with petit mal. Etiologic significance and modification by anticonvulsant drugs and the ketogenic diet. Epilepsia 1964;5:239-255). The urinary excretion of electrolytes was increased and particularly that of calcium, magnesium and sodium, resulting in a negative balance of sodium, potassium, calcium, magnesium, phosphorus and nitrogen. The anticonvulsant action of the ketogenic diet was unrelated to diuresis, independent of acidosis, and was correlated with an increased urinary excretion and a negative balance of sodium and potassium, electrolytes known to affect the seizure threshold. Further reports of the mechanism of the diet are reviewed in Millichap JG, Ed. Progress in Pediatric Neurology, I, II, and III, Chicago, PNB Publishers, 1991, 1994, 1997.

## VASCULAR DISORDERS

### **RISK FACTORS FOR POOR OUTCOME IN STROKE**

Risk factors for stroke in children and their relationship to outcome were determined by reviewing charts of 72 patients with ischemic and hemorrhagic strokes at the Universities of Montreal and Toronto, Canada. Of 51 with ischemic strokes, 46 were arterial and 5 sinovenous thromboses. Risk factors were variable and multiple in 24% of the 51 with ischemic stroke. Ischemic stroke recurred in 8% of patients with a single or no risk factor and in 42% with multiple risk factors ( $p=0.01$ ). Of 21 with hemorrhagic stroke, none had multiple risk factors, 67% were caused by vascular abnormalities, and 10% recurred. Outcomes in the total 72 patients were as follows: 36% were asymptomatic, 45% had epilepsy or persistent neurologic deficit, and 20% died. Those with recurrent stroke had a greater risk of dying (40%) than those without (16%).

Hematologic and metabolic screening should be a part of the workup of ischemic stroke, even when a cause is known. This should include aPL antibodies, protein C and S antibodies and deficiencies, antithrombin, factor V Leiden, and hyperhomocysteinemia. Other significant risk factors include cardiac abnormalities occurring in 20% of patients with ischemic stroke, vasculopathies (25%), sickle cell disease, and recent or concurrent systemic or intracranial infection and mild head and neck trauma. (Lamthier S, Carmant L, David M, Larbrisseau A, de Veber G. Stroke in children. The coexistence of multiple risk factors predicts poor outcome. Neurology January (2 of 2) 2000;54:371-378). (Reprints: Dr L Carmant, Department of Pediatrics, Division of Neurology, Hôpital Sainte-Justine, 3175 Chemin de la Cote Sainte-Catherine, Rm 2130, Montreal, Quebec, Canada, H3T 1C5).

COMMENT. Multiple risk factors are common in children with ischemic stroke and may predict stroke recurrence. Mortality increases with stroke recurrence.

**Neonatal hemorrhagic stroke.** Two variants of temporal lobe infarction are described in 10 neonates treated at Gent University Hospital, Belgium (Govaert P, Smets K, Matthys E, Oostra A. Neonatal focal temporal lobe or atrial wall haemorrhagic infarction. Arch Dis Child Fetal Neonatal Ed Nov 1999;81:F211-F216). All except 2 were VLBW infants with hyaline membrane disease. The injury was venous infarction with temporal or para-atrial matrix hemorrhage. Except for one fatal case, intraventricular bleeding was mild to moderate. The lesions were detected by sonography. Survivors scored in the low normal range on the Bayley Mental Development Index; one developed temporal lobe epilepsy.