

# PEDIATRIC NEUROLOGY BRIEFS

## A MONTHLY JOURNAL REVIEW

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Vol. 20, No. 5

May 2006

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### SEIZURE DISORDERS

#### **MRI ABNORMALITIES AFTER PROLONGED FEBRILE SEIZURES**

The clinical, radiologic, and laboratory findings of 17 Asian patients with encephalopathy following a prolonged febrile seizure were reviewed retrospectively at Kameda Medical Center, and other centers in Japan and San Francisco, USA. Ages ranged from 10 months to 4 years (16 were 2 years or less). All patients presented with a febrile seizure lasting longer than 30 min, and longer than 1 hour in 12 patients. Twelve patients had continuous impaired consciousness, while 5 recovered consciousness completely and had no neurologic symptoms on the next day. Second seizures, clusters of complex partial seizures associated with impaired consciousness, occurred at 4 to 6 days after the initial seizure in 16 patients. Outcome was almost normal in 1 child, mild mental retardation (MR) in 3, and severe MR with paralysis and/or epilepsy in 11. Of 5 with rapid post-ictal recovery of consciousness, 3 had good outcomes, and 2 had moderate or severe MR.

Infectious agents identified in 10 patients were influenza A and B in 4, human herpes virus (HHV) 6 and 7 in 4, varicella zoster virus (1), and adenovirus (1). Analyses of CSF showed no pleocytosis and normal protein levels in the 17 patients, consistent with a diagnosis of encephalopathy. EEG showed slowing or epileptic discharges in 15 of 16 patients examined in the acute stage. MRIs obtained between 3 and 9 days after the initial prolonged seizure showed subcortical white matter lesions in all 17 patients, especially on diffusion-weighted MRI. Lesions were predominantly frontal or frontoparietal in location with sparing of the periorlandic region. Diffusion abnormalities disappeared between days 9 and 25, leaving cerebral atrophy after 2 weeks. Three patients with only frontal lesions had good outcomes. (Takanashi J, Oba H, Barkovich AJ, et al. Diffusion MRI abnormalities after prolonged febrile seizures with encephalopathy. **Neurology** May (1 of 2) 2006;66:1304-1309). (Reprints: Dr J-I Takanashi, Department of Pediatrics, Kameda Medical Center, 929 Higashi-cho, Kamogawa-shi, Chiba 296-8602, Japan).

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COMMENT. The authors describe an encephalopathy associated with a prolonged febrile seizure and generally resulting in a poor outcome. In 10 of 17 patients, the infectious agent was isolated from the throat, but neither viral PCR analysis of the CSF nor cytokine levels were recorded. The encephalopathy was similar to that described with influenza A (Kawada J-I et al. **J Infect Dis** 2003;188:690-698; and HHV-6-associated febrile seizures (Akasaka M et al. **Brain Dev** 2005;27:30-33). Some viruses (eg influenza A, HHV-6) particularly prone to cause encephalopathy or complex febrile seizures result in excessive systemic immune and cytokine responses (Millichap JG, Millichap JJ. **J Infect Dis** 2004;189:564-565). In febrile seizure patients CSF viral invasion is unusual, and the height of the fever has a more essential role in the febrile seizure mechanism than a specific viral neurotropism. Influenza-associated febrile seizure patients have significantly higher serum levels of pro-inflammatory cytokines than febrile patients without seizures (Masuyama T et al. **Pediatr Neurol** 2002;27:289-292). Cytokine levels are useful indicators of the severity of the infection and the associated encephalopathy (Ichiyama T et al. **Cytokine** 2004;27:31-37), and may help to distinguish the complex febrile seizure from an encephalopathy. Future research concerning the mechanism of encephalopathy complicating prolonged febrile seizures should include CSF viral PCR analysis, cytokine levels, and immune responses.

## STATUS EPILEPTICUS INDUCED BY ANTIEPILEPTIC DRUGS

Adolescent and adult patients with idiopathic generalized epilepsy (IGE) who developed paradoxical video-EEG documented status epilepticus (SE) precipitated by inappropriate antiepileptic drugs (AEDs) were studied retrospectively at Hopital Pasteur, Nice; Hopital Ranguel, Toulouse; and Hopital Henri-Gastaut, Marseilles, France. Among 14 patients, aged 15-46 years, identified, 5 had typical absence SE (ASE), 5 had atypical ASE, 3 had atypical myoclonic SE (MSE), and one had typical MSE. All experienced an increase in seizures or new seizure types before occurrence of SE. Epilepsy had been misclassified as cryptogenic partial in 8 cases and cryptogenic generalized in 4, leading to inappropriate choice of AEDs. All had received carbamazepine (CBZ) that caused seizure aggravation before referral. Polytherapy with phenytoin (PHT), vigabatrin (VGB) or gabapentin (GBP) had been used in 7 patients. Seizures were precipitated following dose increases of CBZ or of CBZ and PHT; by initiation of CBZ, VGB or GBP; and by a decrease of phenobarbital. Withdrawal of the inappropriate medication and substitution of valproate (VPA) monotherapy in 5 and polytherapy including VPA in 8 resulted in complete seizure control. Interictal EEGs after successful seizure control were normal or showed only rare bursts of spike-and-wave on a normal background. The correct diagnosis was juvenile absence epilepsy in 6 patients, juvenile myoclonic epilepsy in 4, epilepsy with grand mal on awakening in 2, and childhood absence epilepsy in 2. (Thomas P, Valton L, Genton P. Absence and myoclonic status epilepticus precipitated by antiepileptic drugs in idiopathic generalized epilepsy. **Brain** May 2006;129:1281-1292). (Respond: Pierre Thomas MD PhD, Unite Fonctionnelle EEG-Epileptologie, Service de Neurologie, Hopital Pasteur, 30 Voie Romaine, 06002 Nice, France).

COMMENT. Paradoxical exacerbation of IGE may result from inappropriate AEDs and may be expressed as absence or myoclonic status epilepticus. CBZ is most often implicated and is contraindicated in absence and juvenile myoclonic epilepsies.