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J. GORDON MILLICHAP, M.D., F.R.C.P., EDITOR

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SEIZURE DISORDERS

EEG FOLLOWING FEBRILE STATUS EPILEPTICUS

Investigators at Lurie Children's Hospital of Chicago; Albert Einstein College of Medicine, NY; Columbia University, NY, and 7 additional members of the FEBSTAT study team report the results of a prospective evaluation of the consequences of febrile status epilepticus (FSE) on the EEG of 199 children (median age 15.8 months; range 12-24 months). Median peak temperature at FSE was 102.7°F and median duration of FSE was 70 minutes. The majority (96%) of EEGs were obtained within 72 hours of status; of the remainder, 2.5% were obtained within a week and 1.5% within a month of FSE. Ninety (45.2%) EEGs were abnormal, including 85 (42.7%) nonepileptiform and 13 (6.5%) epileptiform (temporal in 6 and central in 4). Significant focal nonepileptiform abnormalities occurred in 60 (30.2%) EEGs; focal slowing involving the temporal region was seen in 47 (right-sided in 36; left-sided in 11) and attenuation occurred in 25, always unilateral and more common on the right. Diffuse background slowing was seen in 22 EEGs, and focal slowing was associated in 11 cases (23.4%). The odds of focal slowing were significantly increased by focal FSE and hippocampal T2 signal abnormality on MRI. High temperature with FSE was associated with significantly decreased odds of focal slowing. Low peak temperature, focal FSE, and hippocampal T2 signal abnormality increased the odds of focal slowing. Focal EEG attenuation was associated with hippocampal T2 signal abnormality. (Nordli DR Jr, Moshe SL, Shinnar S, et al. Acute EEG findings in children with febrile status epilepticus. *Neurology* 2012 Nov 27;79(22):2180-2186). (Response: Dr Nordli: E-mail: dnordli@luriechildrens.org).

COMMENT. EEGs obtained within 72 hours of FSE show focal slowing or attenuation in 30% and these abnormalities are associated with evidence of acute hippocampal injury on MRI. In contrast, epileptiform abnormalities occur infrequently. The FEBSTAT investigators conclude that the EEG performed immediately after febrile

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status epilepticus is more sensitive than the MRI as a biomarker for the prediction of subsequent epilepsy.

Previous studies of the EEG in children with febrile seizures, some performed in the 1950s-60s and cited by the FEBSTAT investigators, also emphasize the frequency and significance of slow wave abnormalities. In addition, Lennox-Buchthal M (**Ugeskr Laeger** 1964 Feb 13;126:203-6) extended her research and performed serial EEGs on children with febrile seizures at varying time intervals after the first seizure as follows: on the third, fourth, or fifth day of admission, 10 days to 2 weeks after admission, and at 3, 6, and 12 months and every year at follow-up visits. The EEGs showing slow frequencies at the third to fifth day after a febrile convulsion had a trace of slowing in some after 10 days to 2 weeks, but the record was normal after an interval of 3 months. Compared to the patients with normal initial EEGs, those with pronounced slow frequencies had a greater incidence of recurrence of febrile seizures and of paroxysmal abnormalities in subsequent records, but the differences in incidence were not significant. Perhaps the larger cohort of the FEBSTAT study will show a more robust correlation between slowing and subsequent epilepsy at follow-up. Repeated EEGs at intervals are advised in some febrile seizure patients with recurrent seizures or other complications so that delayed emergence of paroxysmal abnormalities and susceptibility to epilepsy with increasing age may be excluded.

CSF IN FEVER-ASSOCIATED STATUS EPILEPTICUS

Investigators at Children's Hospital of the King's Daughters, Eastern Virginia Medical School, Norfolk, VA; Albert Einstein College of Medicine, Bronx, NY; Columbia University, NY; and other centers on behalf of the FEBSTAT Study Team assessed CSF findings in 154 (77%) of 200 patients with fever-associated status epilepticus (FSE). LP was performed at the discretion of the attending physicians, and 136 children had a nontraumatic LP (<1000 red blood cells; 116 (96.2%) of the 136 had ≤ 3 white blood cells/mm³). Likelihood of an LP performed in the ED was significantly higher in younger children, in those with the first FS, a longer median duration of FSE, febrile status epilepticus, and a focal FSE. Mean CSF protein level was 22 mg/dL (range, 8-137 mg/dL); 3 (2.3%) had a protein level >60 mg/dL. Mean CSF glucose level was 89.6 mg/dL (range, 46-201 mg/dL). Excess WBCs in the CSF should not be attributed to the seizure (Frank LM, Shinnar S, Hesdorffer DC, et al. Cerebrospinal fluid findings in children with fever-associated status epilepticus: Results of the Consequences of Prolonged Febrile Seizures (FEBSTAT) Study. **J Pediatr** 2012 Dec;161(6):1169-1171.e1). (Reprint requests: L. Matthew Frank MD. E-Mail: matthew.frank@chkd.org).

COMMENT. LP performed at the discretion of the attending physician confirms that the CSF is usually normal in children with FSE. Abnormal CSF results should not be attributed to the seizure and should prompt close investigation and treatment for suspected meningitis.

Clinical manifestations and complex seizures are the principal indications for lumbar puncture, not patient age, in a study of 100 consecutive febrile seizure patients treated in a tertiary hospital ED. (Millichap JJ et al. **Pediatr Neurol** 2008 Dec;39(6):381-6). Eleven (78.6%) patients undergoing LP had complex FS, 3 manifesting prolonged