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

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SEIZURE DISORDERS

NEUROIMAGING FOR NEW-ONSET AFEBRILE SEIZURES

The prevalence of clinically significant abnormal neuroimaging in children presenting in the emergency department (ED) with new-onset afebrile seizures (ASZ) was determined in a series of 500 consecutive cases seen over a 34-month period between October 1996 and July 1998 at the Children's Hospital, Boston, MA. The median age was 46 months (range, 0-21 years). Neuroimaging was obtained in 95% of cases (in 92% while in the ED, and in 3% after leaving the ED but within 72 hours). CT was the initial study in 91% and MRI in 4%. Normal results were reported in 83% (395/475); abnormalities were clinically insignificant in 9% and clinically significant in 8% (38/475). Abnormalities included brain hemorrhage in 8 patients, vascular infarction in 7, cyst or tumor in 6, infection-related in 4, dysgenesis in 4, hydrocephalus in 3, and var in 6. Of those with abnormal imaging, 8% (3/38) expired, following anoxic brain injury and status epilepticus in 2, and after severe head injury in 1. Operative interventions were required in 13% (5/38), including shunt revision for hydrocephalus, hemispherectomy, and resection of cerebral tumor. Criteria for a high risk of clinically significant imaging abnormalities, identified by recursive partition analysis, were as follows: 1) presence of a predisposing condition (sickle cell, bleeding, cerebral vascular, or neoplastic disorder; HIV infection; hydrocephalus; travel to cysticercosis-endemic areas; and closed-head injury), and 2) focal seizure in a child <33 months of age. Among 121 high risk patients (25% of 475), 32 (26%) had clinically significant abnormal neuroimaging, compared to 6 (1.7%) of 354 patients considered at low risk of showing abnormalities. The diagnoses among the 6 patients with neuroimaging abnormalities, but categorized as low risk, included subdural hematoma, anoxic brain injury, arachnoid cyst, frontal lobe tumor, heterotopia, and hypertensive encephalopathy. Clinically significant abnormalities in emergent neuroimaging for new-onset afebrile seizures were identified in a relatively small

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percentage of children in this large, retrospective study. Neuroimaging should be considered for children who meet high-risk criteria. Those without predisposing conditions or focal seizures, at low risk for abnormal imaging, may be discharged from the ED without neuroimaging, provided that the neurologic exam and mental status are normal and follow-up is assured. (Sharma S, Riviello JJ, Harper MB, Baskin MN. The role of emergent neuroimaging in children with new-onset afebrile seizures. *Pediatrics* January 2003;111:1-5). (Respond: Sujit Sharma MD, Department of Emergency Medicine, Children's Healthcare of Atlanta at Scottish Rite, 1001 Johnson Ferry Rd, Atlanta, GA 30342).

COMMENT. An editorial commentary affirms that less testing is needed in the emergency room after a first afebrile seizure, that the evaluation of a child is often erroneously extrapolated from the adult in whom tumors and vascular events are more common causes of first seizures, and the cost of routine tests, especially neuroimaging, outweighs the benefit. A careful history and physical examination would have identified the majority of patients in the high risk category found to have clinically significant neuroimaging abnormalities. Unless there are special circumstances, blood work, lumbar puncture, EEG, and neuroimaging are not needed in the ED evaluation of a first afebrile seizure. A thorough discussion with the parents and older patients concerning the nature and cause of a seizure, precautions, and prognosis is the most important aspect of management of the seizure. (Freeman JM. *Pediatrics* 2003;111:194-196).

The Quality Standards Subcommittee of the American Academy of Neurology, Child Neurology Society, and American Epilepsy Society (*Neurology* 2000;55:616-623), after reviewing published literature, also advise against routine lumbar puncture, laboratory studies, and routine neuroimaging after a first unprovoked nonfebrile seizure. Emergency imaging should be reserved for patients with new-onset neurologic deficit or persisting changes in mental status. MRI may be indicated on a nonemergency basis for diagnosis of specific epilepsy syndromes. Contrary to the opinion proposed in the editorial commentary, the Quality Standards Subcommittee recommends an EEG after a first nonfebrile seizure. An EEG is useful in predicting risk of seizure recurrence, differentiation and diagnosis of the paroxysmal event, diagnosis of epileptic syndromes, and prognosis, and may influence the need for subsequent neuroimaging. It may not influence the decision to treat. Treatment with anti-epileptic drugs (AED) should be individualized and is not recommended routinely. It may decrease the risk of a second seizure, but not the long-term risk of subsequent epilepsy. In most cases, AEDs are not recommended after a first afebrile seizure. In a recently published practice parameter report of the Quality Standards Subcommittee, treatment with AED may be considered when the benefits of reducing the risk of a second seizure outweigh the risks of AED side effects (*Neurology* Jan 2003;60:166-175).

TREATMENT OF A FIRST UNPROVOKED SEIZURE

The Quality Standards Subcommittee of the AAN and Practice Committee of the CNS have reviewed published literature to determine when to begin treatment after a first unprovoked seizure, risk of recurrence, prevention of recurrence, development of chronic epilepsy, and side effects of AEDs. Treatment after a first unprovoked seizure decreases