to cause behavioral side effects (Tyler MW, King EQ. JAMA 1951;147:17-21). The severity of psychosis is directly related to the control of seizures. Personality changes, aggressive behavior, paranoid and depressive reactions, and acute psychosis were reported in 17% of patients treated. The use of phenacemide was largely discontinued because of the risk of mortalities from aplastic anemia and hepatitis. Coker SB and colleagues resurrected phenacemide for therapy of complex partial seizures in 13 children at Loyola University and Christ Hospital, Chicago, IL (Neurology 1987;37:1861-1866). Twelve responded, 9 were seizure-free for 2-12 months, one had a behavior and personality disorder, and one developed nausea and vomiting necessitating drug withdrawal. (see Progress in Pediatric Neurology I, PNB Publ, 1991;pp77-78).

"Paradoxical normalization" in childhood epilepsy (acute psychiatric symptoms with abrupt cessation of seizures and normalized EEG) was particularly common during trials of phenacemide in the 1950's, but this phenomenon is also reported concomitant with the control of Lennox-Gastaut syndrome and other seizures by ACTH therapy (Amir N, Gross-Tsur V. Epilepsia 1994;35:1060-1064; see Progress in Pediatric Neurology III, 1997;pp71-73). One patient, aged 9, became seizure free within 7 days of initiating ACTH. His behavior changed, he became disoriented, aggressive, hyperactive, dyspraxic, and dysphasic, and he required psychiatric hospitalization. He gradually improved over 5 years. In 2 patients with paradoxical normalization, seizures recurred when ACTH and vigabatrin were discontinued, and the psychiatric symptoms resolved. Discontinuance of the offending anticonvulsant and recurrence of seizures are usually followed by normalization of behavior.

VASCULAR AND TRAUMATIC DISORDERS

BRAIN INJURY WITH SICKLE CELL DISEASE

The relationship between brain injury and vasculopathy in 146 sickle cell (SCD) patients with hemoglobin SS, the most serious form of SCD, was evaluated by MRI and MRA at St Jude Children's Research Hospital, Memphis, TN. At an average age of 10 years, 46% of patients had brain injury revealed by MRI in the form of cystic infarction, ischemic damage, encephalomalacia, or atrophy, and 64% had vasculopathy identified by MRA as arterial totuosity (limited vasculopathy), and stenosis or occlusion (extensive vasculopathy). Patients with abnormal MRA usually had abnormal MRI, and only 28% had normal neuroimaging and angiography. Vasculopathy is prodromal to brain injury with SCD; it was limited in patients with cystic infarction and extensive with encephalomalacia. Large arteries were affected in 31% of patients with brain injury and small arteries in 69%. The degree of brain injury with SCD is related to the degree of vasculopathy. (Steen RG, Xiong X, Langston JW, Helton KJ. Brain injury in children with sickle cell disease: prevalence and etiology. Ann Neurol November 2003;54:564-572). (Respond: Dr R Grant Steen, Department of Psychiatry, University of North Carolina at Chapel Hill, Campus Box 7160, Chapel Hill, NC 27514).

COMMENT. Brain injury is a common complication of sickle cell disease with hemoglobin SS, and the severity of injury is correlated with the degree of vasculopathy. Patients with normal vasculature have normal MRI and MRA, those with mild

vasculopathy have limited brain injury (cystic infarction and lacunae), and patients with extensive vasculopathy (stenosis or occlusion) have severe brain injury (encephalomalacia). Brain injury in SCD may be preventable if the anemia and vasculopathy are corrected and reversed.

POSTTRAUMATIC NONHEMIC SUBDURAL EFFUSION

The time course for the development of subdural fluid collections after a single traumatic event in 55 head trauma patients younger than 3 years was determined by CT scan in a retrospective consecutive case series at Children's Hospital of Wisconsin, Milwaukee. The date of injury could be determined for 55 (64%) of 86 patients with trauma-related subdural fluid collections. The mean age for the 55 patients (33 boys, 22 girls) was 8.4 +/- 13.1 months). The mechanism of injury was intentional trauma in 41 (75%), unintentional trauma in 10 (18%), and uncertain intent in 4 (7%). The initial visualization of subdural fluid in 267 CT examinations occurred during the first week after injury in 44 (80%) of 55 patients. In the remaining 11 patients, the time of origin of subdural fluid was less than 2 weeks for 4 and less than 3 weeks for 6. The location of the fluid was frontal in all but 1 patient (98%). The fluid collection was unilateral in 9 (16%) and bilateral in 46 (84%). Hemorrhage accompanying the subdural effusion was subdural in 48 (87%) patients, epidural in 3 (6%), and subarachnoid in 1 (2%). Eight (15%) patients died within 30 days of injury. Subdural fluid collections persisted for at least 1 month in 10 (18%), spontaneous resolution occurred in 14 (25%), and subdural shunts were placed in 8 (15%). Brain atrophy, with enlarged ventricles and sulci, developed in 16 (48%) of 33 patients followed with CT for at least 2 weeks after injury. (Wells RG, Sty JR. Traumatic low attenuation subdural fluid collections in children younger than 3 years. Arch Pediatr Adolesc Med October 2003;157:1005-1010). (Reprints: Robert G Wells MD, Department of Radiology, Children's Hospital of Wisconsin, Mail Stop 721, 9000 W Wisconsin Ave, PO Box 1997, Milwaukee, WI 53201).

COMMENT. Low attenuation subdural fluid on CT in infants with a history of head injury should raise the suspicion of child abuse. The appearance of subdural fluid most often occurs within a few days of the trauma.

Neuroimaging of intraparenchymal lesions predicted outcome in shaken baby syndrome in 23 children with nonaccidental head injury. (Bonnier C et al. Pediatrics October 2003;112:808-814). A low Glasgow Coma Scale score, retinal hemorrhages, skull fracture, cranial growth deceleration, and brain atrophy on MRI (15 days to 3 months after injury) were significantly associated with poor developmental outcome.

Abusive head injury as a cause of apparent life-threatening events (ALTE) **in infancy** was diagnosed in 6 (2.5%) of a consecutive series of 243 infants younger than 12 months admitted to Westchester Medical Center, New York Medical College, Valhalla (Altman RL et al. Arch Pediatr Adolesc Med October 2003;157:1011-1015). ALTE is a sudden breathing abnormality, color change, or altered muscle tone or mental status, often requiring emergency resuscitation. Thirty-five different causes of ALTE were identified, and abusive head injury was responsible in 1 admission every 5 months. An ophthalmologic examination revealed retinal hemorrhages leading to a CT scan in 4 of the