17 (57%) received CT scans, and 3 (18%) were abnormal (a maxillary opacification, a mucous retention cyst, and an occult vascular malformation). Of 8 (27%) who had an MRI, 2 (25%) were abnormal, 1 a Chiari type 1 malformation and the other an occult vascular malformation. The yield of neuroimaging (CT and MRI) in children with uncomplicated migraine and chronic daily headache was 4% and 17%, respectively. It was concluded that since none of the abnormalities was associated with headache presentation or necessitated surgical intervention, the neuroimaging was not warranted in these patients. (Lewis DW, Dorbad D. The utility of neuroimaging in the evaluation of children with migraine or chronic daily headache who have normal neurological examinations. Headache Sept 2000;40:629-632). (Respond: Dr Donald W Lewis, Division of Pediatric Neurology, Children's Hospital of the King's Daughters, Eastern Vitginia Medical School, Norfolk, VA).

COMMENT. In children presenting with uncomplicated migraine and chronic daily headache and having a normal neurologic examination, the yield of neuroimaging studies is 4% and 17%, respectively. In the above retrospective analysis of cases, the types of CT and MRI abnormalities detected were not considered significant in the etiology and management of the headache disorder. It was concluded that neuroimaging is unwarranted in these specific headache syndromes. The occurrence of Chiari 1 malformation in 3 cases cannot be dismissed as a coincidental finding, however, since headache may be the presenting symptom and surgery has occasionally been advocated (Stovner IJ et al. 1992; see Progress in Pediatric Neurology II, 1994;p158). The authors admit that further research is required, to include large prospective studies and the role of repeated neuroimaging in previously negative studies. The importance of neuroimaging in children with headache associated with abnormal neurological or significant physical findings is accepted.

While routine neuroimaging may not be warranted for the pediatrician or family practitioner who has referred the child with recurrent headache for consultation, practice guidelines for the pediatric neurologist must also include the availability of the patient for follow-up. If MRI is deferred, more frequent clinical neurologic evaluations may be necessary to exclude some underlying neurosurgical lesion. Headache, without localizing neurologic abnormalities or signs of increased intracranial pressure, may be an uncommon presenting symptom of brain tumor. The luxury of observation over time is not always available to the neurologist, and the deferral of imaging may not be practical or judicious. (See Progress in Pediatric Neurology III, 1997;p185, for previous studies on brain imaging indications for headaches and commentary).

TOXIC ENCEPHALOPATHY

KERNICTERUS RE-EMERGENCE AND PREVENTION

Six cases of kernicterus in term and near-term infants, diagnosed in Denmark between 1994 and 1998, are reported from the University Hospital of Aalborg. These reports contrast with a complete absence of cases in Denmark for the previous 20 years. The etiology of the hyperbilirubinemia was spherocytosis, galactosemia, A-O blood type incompatibility in 2, and unknown in 2. The maximum plasma total bilirubin concentrations were 531-745 mcmol/L. Causes listed for the re-emergence of cases of kernicterus include the following: 1) a decreased awareness of signs of kernicterus; 2) premature discharge of infants from the maternity ward; 3) breast-feeding associated jaundice; 4) difficulty in recognition of jaundice in some ethnic patient groups. The following preventive

measures are considered: a) alert healthcare workers to the risks of bilirubin encephalopathy; b) instruct mothers more fully before discharge; c) more liberal use of infant formula supplements; d) lower plasma bilirubin limits for phototherapy and exchange transfusion; e) screen all term and near-term infants; f) use skin jaundice detection device that corrects for melanin content. (Ebbesen F. Recurrence of kernicterus in term and near-term infants in Denmark. Acta Paediatr Oct 2000;89:1213-1217). (Respond: Dr Finn Ebbesen, Department of Paediatrics, University Hospital of Aalborg, DK-9000 Aalborg, Denmark).

COMMENT. A recent increase in the cases of kernicterus in term or near-term infants in Denmark has raised concerns regarding the primary and secondary healthcare recognition and management of the problem. A larger prospective study of infants with elevated bilirubin levels should be performed prior to considering a population-based screening program.

Prediction and prevention of hyperbilirubinemia is currently a concern in the USA. (Newman TB et al. Arch Pediatr Adolesc Med Nov 2000;154:1140-1147). The predictors of extreme neonatal hyperbilirubinemia (> or = to 428 mcmol/L) determined in 11 Northern California Kaiser Permanente hospitals and a cohort of >51,000 term newborns included the following: 1) family history of jaundice in a newborn; 2) exclusive breastfeeding; 3) cephalhematoma. No case of kernicterus was diagnosed.

Diagnosis of kernicterus. The characteristic neurological findings of kernicterus (athetosis, impaired vertical gaze, and auditory loss or imperception) may not evolve until 4 years of age. In the neonatal period, the diagnosis is suspected when an infant with hyperbilirubinemia becomes drowsy, hypertonic and opisthotonic, the Moro reflex is absent, and the cry abnormal. Clonic convulsions occur in about 10% of cases. Early classic references to kernicterus as a form of cerebral palsy are by Byers RK, Paine RS, and Crothers B (Pediatrics 1955;15:248) and Perlstein MA (Charles C Thomas, 1961).

SEIZURE DISORDERS

BRAIN VOLUME REDUCTION WITH INTRACTABLE EPILEPSY

Cerebral, cerebellar, and hippocampal volumes were measured by quantitative magnetic resonance imaging on 112 children, ages 4 - 18 years, with epilepsy syndromes, determined by video-EEG telemetry, at Sydney Children's Hospital, Randwick; St Vincent's Hospital, Victoria; and New Children's Hospital, Westmead, New South Wales, Australia. A significant reduction in cerebral (13%) and cerebellar (8%) volume was present in the epilepsy group compared with 44 controls. This included partial epilepsies such as frontal lobe epilepsy. Hippocampal asymmetry was more sensitive than volume reduction as a marker for mesial temporal lobe epilepsy. Volume reduction was independent of age of onset and duration of epilepsy, suggesting that brain volume reduction is present at the onset of epilepsy and is not the result of intractable seizures. IQ was significantly correlated with cerebral and cerebellar volume, but not with duration or age of onset of epilepsy. (Lawson JA, Vogrin S, Bleasel AF, Cook MJ, Bye AME. Cerebral and cerebellar volume reduction in children with intractable epilepsy. Epilepsia November 2000;41:1456-1462). (Reprints: Dr Ann ME Bye, Department of Paediatric Neurology, Sydney Children's Hospital, Randwick, 2031 New South Wales, Australia).