Pulsing electromagnetic fields (PEMF) in treatment. This novel therapy was studied by double-blind, placebo-controlled trial in 42 adults at the Orthopedic Surgery Service, Madigan Army Medical Center, Tacoma, WA (Sherman RA, et al. Headache Sept 1999;39:567-575). Exposure of the inner thighs to PEMFs for at least 3 weeks was considered an effective, short-term prophylactic treatment for migraine, but not in patients with tension headaches.

Increased incidence of migraine headache in female subjects of all ages is reported from the Mayo Clinic, following a study in Olmsted County, Rochester, MN, comparing the 1979-1981 period and 1989-1990. The peak incidence at age 20-29 years increased from 634 new cases per 100,000 person-years to 986 in a decade. (Rozen TD et al. Neurology Oct 1999;53:1468-1473).

Increased brain serotonin synthesis in migraine was demonstrated using PET in 11 women patients in comparison to 8 healthy controls. The results are consistent with reports of systemic alteration of serotonin metabolism in patients with migraine without aura. (Chugani DC et al. Neurology Oct 1999;53:1473-1479).

SEIZURE DISORDERS

VITAMIN B12 DEFICIENCY AND INFANTILE CONVULSIONS

The association of vitamin B12 deficiency and benign familial infantile convulsions (BFIC) is reported in one 4-month-old boy admitted to the University Hospital, Lund, Sweden, and in an additional 4 of 14 infants with BFIC who were found to have homocysteinuria or methylmalonic aciduria. The 4-mo-old presented with generalized tonic-clonic convulsions, partially responsive to vigabatrin. CT and initial EEGs were normal, and an ictal recording showed epileptiform activity over the left frontal region. Laboratory investigations were normal except for absent plasma cobalamin levels (<75 pmol/l), elevated plasma homocysteine (16.5 mcmol/l; N 5.3-11.0) and methylmalonic acid (0.88 mcmol/l; N<0.42), consistent with a diagnosis of vitamin B12 deficiency. The mother had anemia treated with intramuscular ferritin-sorbitol during the pregnancy. The infant received oral vitamin B12, 0.5 mg every 3 d, and seizures were controlled, except for a convulsion with fever. Treatment was discontinued at 7-12 months when laboratory tests were normal, and at 1.5 year follow-up, seizures had not recurred and development was normal. (Lundgren J, Blennow G. Vitamin B12 deficiency may cause benign familial infantile convulsions: a case report. Acta Paediatr Oct 1999;88:1158-1160). (Respond: Dr J Lundgren, Department of POediatrics, University Hospital, S-221 85 Lund, Sweden).

COMMENT. Infants of vegetarian mothers or those suffering from pernicious anemia may develop vitamin B12 deficiency in early infancy, leading to convulsions in susceptible infants. In the present case-report, the cause of the vitamin B12 deficiency is undetermined, but a genetic error in B12 metabolism cannot be excluded. The familial incidence of benign familial infantile convulsions (BFIC) indicates a genetic etiology, with linkage analysis mapped to chromosome 19. Environmental influences involving vitamin B12 metabolism in the mother and deficiency in the infant are also causative.

Infants with seizures in the first year of life should be examined for homocysteine and methylmalonic acid elevations in the plasma and a transient vitamin B12 deficiency, responsive to vitamin supplementation. Vitamin B12 is a

co-factor in methionine synthatase and methylmalonyl-CoA-mutase, a deficiency leading to the accumulation of homocysteine and methylmalonate in the plasma.

CSF NEOPTERIN LEVELS IN FEBRILE CONVULSIONS

Neopterin, a marker for activation of the cellular immune system, and interferon-gamma were measured in the cerebrospinal fluid of 40 infants and young children (ages 0.75 to 4.6 years) admitted with fever and/or convulsions to Nippon Medical School 2nd Hospital or Tama Nagayama Hospital, Japan.

CSF neopterin levels were significantly higher in 11 patients with febrile convulsions than in 22 with fever without convulsions or in 7 with convulsions without fever, 4 with status epilepticus. The CSF neopterin/serum neopterin ratio was also higher in patients with typical febrile convulsions, and those with prolonged febrile convulsions had higher CSF neopterin levels than patients with typical febrile convulsions. CSF interferon-gamma showed a tendency to higher levels in patients with febrile convulsions. (Kawakami Y, Fukunaga Y, Kuwabara K et al. Clinical and immunological significance of neopterin measurement in cerebrospinal fluid in patients with febrile convulsions. Brain Dev Oct 1999;21:458-460). (Respond: Dr Y Kawakami, Nippon Medical School Second Hospital, Department of Pediatrics, 1-396, Kosugi, Nakahar-ward, Kawasaki, Kanagawa 211-8533, Japan).

COMMENT. Neopterin CSF levels are elevated in children with febrile convulsions, pointing to a mechanism involving an immune activation in the central nervous system. None had pleocytosis of the CSF, and the cause of the elevated neopterin levels is undetermined.

LOW-DOSE ACTH THERAPY FOR INFANTILE SPASMS

The lowest effective ACTH dose, with fewest adverse effects, for the treatment of West syndrome (WS) was determined in a comparative, randomly assigned, controlled study involving 25 patients with cryptogenic (CWS, n=9) or symptomatic (SWS, n=16) WS, at the Department of Pediatrics, Tokyo Women's Medical University, Tokyo, Japan.

Either low dose (0.005 mg/kg per day = 0.2 IU/kg per day) or high dose (0.025 mg/kg per day = 1 IU/kg per day) synthetic ACTH, was administered every morning for 2 weeks and tapered to zero over the subsequent 2 weeks. In the CPS group, infantile spasms and hypsarrhythmia were completely controlled in 3/4 given low-dose and 5/5 on high-dose ACTH. In the SWS group, spasms and hypsarrhythmia were controlled in 6/8 at each dose level. No significant differences were observed between low and high-dose ACTH for either type of WS. Long-term responses in the 17 responders followed for more than 1 year showed no significant differences among groups. Sleepiness and brain shrinkage estimated by CT scan were significantly milder in the low-dose group. Low-dose ACTH therapy may be equally effective as high-dose and is recommended in CWS and in SWS with cerebral atrophy. (Yanagaki S, Oguni H, Hayashi K et al. A comparative study of high-dose and low-dose ACTH therapy for West syndrome. Brain Dev Oct 1999;21:461-467). (Respond: Dr Shigeru Yanagaki, Department of Pediatrics, Tokyo Women's Medical University, 8-1 Kawada-cho, Shinjuku-ku, Tokyo 162, Japan).

COMMENT. The controversy regarding the optimum dosage of ACTH for treatment of infantile spasms continues, the low-dose, short-duration regimen favored in Japan, the high-dose, extended treatment advocated by the majority in the United States and the UK. My own preference has been for smaller doses (10-20 units Acthar gel daily IM for 3 weeks), with relative avoidance of serious side-