

## HEADACHE DISORDERS

### ROLE OF ANTIPILEPTIC DRUGS IN MIGRAINE PREVENTION

Abnormal brain excitability as a migraine trigger mechanism, and the use of antiepileptic drugs (AED) in migraine prevention, are reviewed from The Chicago Medical School, North Chicago, IL. Brain imaging with functional MRI and magnetoencephalography (MEG) have shown that the migraine aura is linked with an abnormal electric and metabolic event consistent with the cortical spreading depression of Leao. Visual activation monitored by MEG and fMRI confirm hyperexcitability of the occipital cortex with triggering of the migraine aura. Low systemic or brain magnesium levels may be involved in the abnormal brain excitability associated with migraine. The comorbidity of migraine and epilepsy may be explained by a common state of brain hyperexcitability. Several antiepileptic drugs have a moderate degree of efficacy in preventing migraine attacks. (Welch KM. Brain hyperexcitability: the basis for antiepileptic drugs in migraine prevention. **Headache** April 2005;45[Suppl 1]:S25-S32). (Respond: Dr K Michael Welch, Rosalind Franklin University of Medicine and Science, 3333 Greenbay Road, North Chicago, IL 60064).

COMMENT. The value of the EEG in children with migraine is controversial, and the EEG is not generally recommended as a routine evaluation (Kramer U, Harel S et al. **Brain Dev** 1994;16:304-308; Gronseth GS, Greenberg MK, **Neurology** 1995;45:1263-1267; **Progress in Pediatric Neurology III**, PNB Publishers, 1997;pp165-194). Kramer et al found epileptic EEGs in 11% of children with both migraine and tension type headaches; the incidence was 26% in girls with chronic, recurrent "very brief" headaches. In an earlier study of the EEG and migraine (Millichap JG. **Child's Brain** 1978;4:95-104), epileptiform EEGs were found in 18% of 100 consecutive children with recurrent headache, and the prevalence was the same in those with migraine as in the total group. In 30 patients with migraine in this series, a trial of the AED phenytoin as prophylactic therapy found that 77% were benefited, but the response to phenytoin was not correlated with an abnormal EEG, the factor that prompted this initial trial of an AED in childhood migraine; in 13 cases with abnormal and 17 with normal EEGs, response rates were 61% and 88%, respectively. These findings support the view that a response to AED does not prove an epileptic or brain hyperexcitability mechanism for migraine headache. Less toxic and more specific AEDs than those currently available might prove of practical value in migraine prophylaxis.

### SPORTS-RELATED POSTTRAUMATIC MIGRAINE

Symptoms and neurocognitive functioning were compared in athletes with no headache (non-HA group), athletes complaining of HA (HA group), and athletes with posttraumatic migraine (PTM group), in a study of 261 high school and college athletes (mean age, 16.36 $\pm$ 2.6 years) at University of Pittsburgh Medical Center; University of North Carolina, Chapel Hill; and Florida Neuroscience Institute, Orlando. A computer software program (ImPACT) designed to assess sports-related concussion found significant

differences in neurocognitive outcome measures for verbal and visual memory, visual motor speed, reaction time, and total symptom scores among the 3 groups. The PTM group had significantly lower verbal memory and visual memory scores post-injury than those in HA and non-HA groups. Differences in these scores were not found between HA and non-HA groups. Similar differences in the 3 groups were observed for visual motor speed scores. The PTM group also had significantly lower reaction time scores than the HA and non-HA groups, and the HA group scores were significantly lower than the non-HA group. The PTM group reported the largest mean increase in post-concussion symptom scores compared with baseline reports. (Mihalik JP, Stump JE, Collins MW et al. Posttraumatic migraine characteristics in athletes following sports-related concussion. **J Neurosurg** May 2005;102:850-855). (Reprints: Mark R Lovell PhD, University of Pittsburgh Medical Center Sports Medicine Concussion Program, 3200 South Water St, Pittsburgh, PA 15203).

COMMENT. High school and college athletes suffering a sports-related concussion accompanied by posttraumatic migraine (PTM) should be followed for symptoms of head injury and also neurocognitive impairments. Baseline and post-injury testing protocols should be available for students at risk for concussion. Neurocognitive test results are essential to determine recovery and fitness to resume sports in athletes suffering from PTM or other post-concussion syndromes.

## INFECTION-RELATED CNS DISEASES

### **HUMAN HERPESVIRUSES-6 AND -7 ENCEPHALOPATHY IN UK**

In a three year prospective study in Britain and Ireland, blood samples of 205 children (2-35 months of age) hospitalized with fever and convulsions and/or suspected encephalitis were tested for primary HHV-6 and -7 infections and reported from Royal Free and University College Medical School, London, UK. Of 156 children aged 2-23 months with primary infection coinciding with the acute illness, 26 (17%) tested positive for HHV (11 children with HHV-6; 13 HHV-7; and 2 with both viruses). All were febrile, 25 had convulsions (status epilepticus in 18), half had a rash, and 11 required ventilation. CSF from 21 patients was negative for HHV DNA, and only 2 had >5 white cells. Primary infection was defined by a) seronegative or low antibody titer in the acute sample containing viral DNA; and b) seroconversion to low avidity IgG antibody and rising titer >4 fold to the virus between acute and early convalescent sera, or low or high avidity IgG antibody between acute and late convalescent sera and viral DNA in the acute sample. The number of cases of HHV was much higher than that expected by chance ( $p<0.001$ ), and HHV-6 and -7 were equally important causes of encephalopathy or convulsions, especially status epilepticus. Children at 1 year receiving MMR or other vaccine and developing fever and convulsion should be tested for HHV infection to avoid misdiagnosis of vaccine reaction. (Ward KN, Andrews NJ, Verity CM et al. Human herpesviruses-6 and -7 each cause significant neurological morbidity in Britain and Ireland. **Arch Dis Child** June 2005;90:619-623). (Respond: Dr KN Ward, Centre for Virology, Department of Infection, Royal Free and University College Medical School (UCL campus), Windeyer Institute, 46 Cleveland St, London W1T 4JF, UK).