leaves. Herbal preparations may also be contaminated by heavy metals such as lead or arsenic that can induce seizures.

Gingko biloba and other herbs may also cause seizures by interference with the absorption and metabolism of antiepileptic drugs (AED). They inhibit cytochrome P450 enzymes (CYP) involved in AED metabolism and oxidation. Gingko induces CYP2C19, reducing serum levels of phenytoin and valproate. Grapefruit juice containing furanocoumarins inhibits the effect of CYP3A4 on AEDs. A large glass of fresh grapefruit juice can significantly increase bioavailability of carbamazepine and diazepam. Some herbal preparations (eg green tea) interfere with AED metabolism by inhibiting or activating P-glycoproteins (Pgps) that alter the absorption and transport of AEDs across the blood-brain barrier. Acetazolamide is a Pgp substrate, and other AEDs may have this property. Herbal formulas contain many herbs and several generic names, adding to the difficulty in predicting the likelihood of seizure induction. (Samuels N, Finkelstein Y, Singer SR, Oberbaum M. Herbal medicine and epilepsy: Proconvulsive effects and interactions with antiepileptic drugs. **Epilepsia** March 2008;49:373-380). (Respond: Dr Noah Samuels, The Center for Integrative Complementary Medicine, Shaare Zedek Medical Center, POB 3235, Jerusalem, Israel 91031. E-mail: refplus@netvision.net.il).

COMMENT. The public demand and interest among physicians regarding the practice of complementary and alternative medicine are expanding. Physicians need to be aware of a potential link between herbal medicine and epilepsy in their patients. Parents of infants and children with refractory or unexplained seizures should be asked about possible use of star anise tea, gingko biloba, or pennyroyal, among other alternative preparations. The FDA cautions the public against the consumption of teas containing star anise. Herbal supplements are considered "natural," and their presumed safety and lack of side effects are rarely questioned. The benefits claimed are generally unsupported by scientific trials. Further research is needed to examine the role of herbal medicine in refractory epilepsy management and the interactions between herbal and conventional therapies.

A review of the literature on PubMed found 118 entries for epilepsy and herbal medicines, 11 involving gingko biloba, 8 ephedra-induced seizures, 6 Chinese and Japanese star anise cases, 2 for pennyroyal, and 2 for eucalyptus-induced seizures. Infants especially are involved.

THE EEG PHOTOPAROXYSMAL RESPONSE

Types of photosensitivity, prevalence and other characteristics of the photoparoxysmal response (PPR), associated seizures, effect of video games, and drug therapy are reviewed by the director of electroencephalography at the University of Illinois, Chicago. Photosensitivity has been graded according to the spread of epileptiform activity: occipital, parietal-occipital, also involving frontal areas, and generalized spike and wave complexes. The majority (65%) of PPR patients have had spontaneous epileptiform abnormalities, generalized spike and wave or partial, temporal lobe, or central rolandic multifocal sharp waves. The prevalence of PPR has diminished over time; in the 1960s it was 3% of all patients having an EEG in this laboratory, whereas now it is a rare occurrence. Studies after 2000 find a prevalence of 0.8%, 1.7% in children, and 1.8% in patients with clinical seizures. PPR is more common in Caucasians and females. Mean age is 12 years.

PPR occurs at the moment of eye opening or closing, and predominantly at a flicker frequency of 15-16 Hz and wavelength of 700nm. Inheritance is autosomal dominant. Luminance studies with sunglasses show variable results in the suppression of PPR. A deep red color is required for induction of PPR. In the prevention of the video game Pokemon effect, blue lenses inhibit the PPR by the short wave length and diminished illumination. Seizures evoked by video games are a manifestation of photosensitive epilepsy. During the PPR 75% patients experience impaired consciousness, opening of eyes or jerking, and pain in the eyes. Persistence of PPR after stimulation is ended is not associated with a higher risk of seizures. Other abnormalities in the EEG, not the PPR are significant in the cause of post-PPR seizures. Prognosis is generally good, especially after age 20 years. Valproic acid and levetiracetam are effective in eliminating PPR. (Hughes JR. The photoparoxysmal response: The probable cause of attacks during video games. **Clin EEG and Neurosci** Jan 2008;39(1):1-7). (Reprints: John R Hughes, MD PhD, University of Illinois Medical Center (M/C 796), 912 S Wood Street, Chicago, IL 60612).

COMMENT. Spikes confined to the occipital region and time-linked with photic stimulation may be a normal finding. Seizures evoked by photic stimulation are usually primary generalized: generalized tonic–clonic, absence, or myoclonic. Photosensitive seizures are classified as pure, occurring only during exposure to photic stimulation, or complicated by spontaneous seizures in addition. Some patients derive a pleasurable response to a self-induced seizure by waving their hands in front of their eyes.

EYELID MYOCLONIA WITH ABSENCES (JEAVONS SYNDROME)

An open-label trial of levetiracetam in 35 patients (23 girls) with eyelid myoclonia (EM) was conducted at the Epilepsy Center, Federico II University, Napoli, and several additional epilepsy centers in Italy. Levetiracetam dosage was 10 mg/kg/day up to 50-60 mg/kg/day in 2 doses in a 12-18 week titration and evaluation phase. Mean dose was 1985 mg/day. Patients' mean age was 19 +/- 6 yrs. Of 28 (80%) patient responders, 6 were seizure-free, 15 had a >75% and 7 a >50% seizure reduction. Associated generalized tonic clonic seizures (GTCS) in 21 patients were controlled in 14 (66%). The number of days with EM and GTCS was significantly reduced compared to baseline. Paroxysmal abnormalities at eye closure and photoparoxysmal response disappeared or were reduced in 20 responders. Mean follow-up was 24 months. (Striano P, Sofia V, Capovilla G et al. A pilot trial of levetiracetam in eyelid myoclonia with absences (Jeavons syndrome). **Epilepsia** March 2008;49:425-430). (Respond: Dr Pasquale Striano MD PhD, Epilepsy Center, Frederico II University, Napoli, Italy. E-mail: pstriano@email.it).

COMMENT. Eyelid myoclonia with absences (Jeavons syndrome, 1977) is characterized by the triad of eyelid myoclonia with or without absences (EMA), seizures and EEG paroxysms induced by eye closure, and photosensitivity (Panayiotopoulos 1996, and others), Onset is in childhood, 2-14 years (mean 8 yrs), especially in girls. Marked intermittent jerking of eyelids after eye closure is associated with jerky upward deviation of eyeballs and retropulsion of the head. Generalized tonic clonic seizures are often associated. AED therapy is usually disappointing, and levetiracetam is the most promising. EMA is not yet recognized as a definite epileptic syndrome by the ILAE.