

EEG CHANGES DURING READING IN ADHD CHILDREN

The relation between electroencephalographic (EEG) findings, behavioral, and continuous performance test indicators were examined in 23 boys, aged 9-11 years, with attention deficit hyperactivity disorder (ADHD) and 23 matched controls in a study at the State University of New York, Cortland, NY, and University of Tennessee, Knoxville, TN. Compared to controls, the EEG results showed increased alpha in posterior regions during baseline for subjects with ADHD. Boys with ADHD showed decreased alpha in the left frontal regions during reading, and increased alpha activity at T5 during a coding task. The ADHD group had poorer performance on the TOVA test than normal controls. (Swartwood JN, Swartwood MO, Lubar JF, Timmermann DL. EEG differences in ADHD-combined type during baseline and cognitive tasks. *Pediatr Neurol* March 2003;28:199-204). (Respond: Dr Swartwood, SUNY Cortland, Psychology Department, Cortland, NY 13045).

COMMENT. The electroencephalogram in children with reading disabilities has been studied for more than 30 years. Hughes JR and Park GE (*Electroencephalogr Clin Neurophysiol* 1969;26:119) found abnormal EEGs in 36% of 157 dyslexic children of normal intelligence. Abnormalities were in 4 groups: 1) those with positive spikes had dyslexia but the highest IQs; 2) those with occipital slowing included the poorest readers; 3) frontal temporal EEG abnormalities were associated with reading disabilities and ocular deficiencies; and 4) epileptiform EEGs with evidence of organic brain damage. An EEG experiment aimed toward identifying dyslexic children (Sklar B et al. *Nature* 1972;240:414-416) found a higher theta-band activity as the most recurring difference from EEGs of normal children.

The EEG abnormalities in the children with ADHD were task and bandpass specific. Significantly more alpha was identified at T5, T6, and O2 during the eyes open baseline condition, when compared to non-ADHD controls. Participants with ADHD fail to suppress alpha activity with eyes open, a finding consistent with the inability to process visual stimuli efficiently. Alpha persistence in the left parietal region during a coding task is indicative of parietal underactivation in ADHD. The finding of increased left frontal alpha activity during reading in both normal controls and ADHD children treated with MPH (Swartwood et al 1998) may indicate inactivation of that region.

Left frontal cortex activation in reading epilepsy. Spike-related fMRI activity was found in the left precentral gyrus, and spread to both central sulci and globus pallidi, in a 15-year-old girl with reading epilepsy. (Archer JS et al. *Neurology* 2003;60:415-421). An associated localized structural abnormality caused the spikes to spread from left middle frontal working memory areas into adjacent motor cortex.

COGNITIVE EFFECTS OF TOPIRAMATE AND VALPROATE

Cognitive and behavioral effects of topiramate (TPM) and valproate (VPA) as adjunctive therapy with carbamazepine (CBZ) were compared in 62 adults (16 to 55 years old) with refractory partial seizures, in a randomized, double-blind trial at the Medical College of Georgia, Augusta. After a 4-week baseline, the study drug was titrated over 8

weeks to target dosages of 400 mg/d TPM, 2250 mg/d VPA, or placebo and then maintained for an additional 12 weeks. Neuropsychological test battery was administered at baseline and at end of titration and maintenance periods. Cognitive deficits associated with TPM relative to VPA were greater at the end of titration than at the end of maintenance. The majority of patients tolerated TPM without cognitive side effects. The statistical differences were due mainly to a small subset of patients who were more negatively affected by TPM. (Meador KJ, Loring DW, Hulihan JF et al. Differential cognitive and behavioral effects of topiramate and valproate. Neurology May 13, 2003;60:1483-1488). (Reprints: Dr KJ Meador, Department of Neurology, Georgetown University Hospital, 1st Floor Bles, 3800 Reservoir Road, NW, Washington, DC 20007).

COMMENT. In early trials of TPM, psychomotor slowing, memory impairment, attention deficits, confusion, and speech problems were reported in 20% of adults with partial seizures (Reife R et al. Epilepsia 2000;41 (suppl 1):S66-71). The TPM-associated cognitive deficits appeared to be related to a rapid escalation of the dosage. Deficits in cognition may be diminished by a more gradual introduction of TPM and by testing after more prolonged usage. Monotherapy is less likely to induce cognitive problems than add-on therapy (Gilliam FG, Veloso F. Epilepsia 1998;39 (suppl 6):56).

INFECTIOUS DISORDERS

EARLY DIAGNOSIS OF HERPES SIMPLEX ENCEPHALITIS

Records of 38 patients, 23 boys and 15 girls (ages 3 months to 16 years [42% ages 3-12 months]), seen between 1990 and 1997 with proven herpes simplex encephalitis (HSE), were reviewed retrospectively to determine the diagnostic reliability of polymerase chain reaction (PCR) results, in a study at the Neuropediatric Service, Hopital Saint Vincent de Paul, Paris, France. Neonatal and adult cases were excluded. The delay between the onset of symptoms and the initiation of treatment and the dose and duration of antiviral treatment were recorded. Patients were divided in 2 groups, according to their PCR results. Nasopharyngeal infections were recorded 1-10 days before the onset of encephalitis in 18 cases (47%). Clinical symptoms of HSE varied with age: Of 24 patients aged <3 years, 19 (79%) had partial febrile seizures, and 1 had a generalized febrile seizure; in 14 patients aged >5 years, febrile seizures occurred at onset in only 5 (36%). Seizures were associated with an altered state of consciousness in approximately 60%, and the others had meningeal irritation, altered behavior, or speech disorders. IV acyclovir was administered for 10-30 days, in a dosage of 30-70 mg/kg/day. The mean delay between the start of acyclovir and the first reported neurological symptoms was 1.5 days.

EEGs recorded in 29 children (76%) were obtained between days 0 and 1 in 80% of cases. EEG abnormalities present in 100% consisted of diffuse slow waves in 9 (31%) and focal slow waves in 20 (69%), of whom 11 were focal temporal and 7 had periodic discharges. Necrotic hemorrhagic brain lesions on CT scan or MRI, observed in 26 (84%) of 31 patients examined, were temporal in location in 12, parietal in 6, and temporoparietal in 4.

HSV PCR performed on CSF (mean, 2.2 samples per patient) obtained between day 0 and 3 in 33 patients was positive in at least 1 CSF sample in 28 (85%). HSV was