

# PEDIATRIC NEUROLOGY BRIEFS

## A MONTHLY JOURNAL REVIEW

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Vol 18, No.10

October 2004

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### SEIZURE DISORDERS

#### EFFECT OF MUSIC ON INTERICTAL EPILEPTIFORM SPIKES

The effect of listening to Mozart's *Sonata for Two Pianos* (K448) on the frequency of interictal epileptiform discharges (IEDs) in the EEGs of four children, ages 5 – 9 years, with benign childhood epilepsy with centrotemporal spikes (BCECTS) was studied in a prospective, randomized, crossover, placebo-controlled trial at the Medical University of South Carolina, Charleston, SC. IED frequency per minute was averaged over each of 3 periods per hour in 4-hour continuous awake EEG recordings: 1) silence/baseline, 15 min; 2) K448 (first and second movements) or control (placebo) music (Beethoven's *Fur Elise*), 18 min; 3) washout period, 27 min. In 2 subjects who demonstrated sufficient waking IEDs for statistical analysis, consisting of 3 epochs of K448-related effects, significant decreases in mean IEDs per minute (33.7, 50.6, and 33.9%) were demonstrated when comparing baseline with exposure to K448, but not with control music. The mechanism of the Mozart effect on IEDs is unknown but an alteration in spike generation is possibly involved. (Turner RP. The acute effect of music on interictal epileptiform discharges. *Epilepsy Behav* 2004;5:662-668). (Respond: E-mail: [TurnerRP@musc.edu](mailto:TurnerRP@musc.edu)).

COMMENT. The history of the so-called Mozart Effect is reviewed by Turner who cites several references in the above article. In previous studies beginning in the early 1990s, statistically significant improvement in spatial reasoning skills on Stanford-Binet intelligence scales was demonstrated in college students listening to Mozart's K448 piano sonata in D major (Rauscher et al, 1993). In the late-1990s, Hughes, Shaw and colleagues demonstrated antiseizure and antiepileptogenic benefits of listening to K448, an effect related to the organization and repeated melodic line of Mozart's music. The complex cortical processing of music may explain the various neuroanatomic and neurophysiologic effects demonstrated

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in studies of the Mozart Effect. The significance of interictal epileptiform discharges and their control in the treatment of epilepsy is controversial. Nonetheless, this pilot, controlled study of the Mozart Effect, if confirmed in larger studies, could lead to new treatment interventions in epilepsy.

## **DAYTIME BEHAVIOR AND SLEEP DISTURBANCE IN EPILEPSY**

Daytime behavior and sleep disturbance in 30 children with epilepsy, mean age 10.3 +/- 2.1 years, were evaluated by parent-rating questionnaires and child symptom self-report measures in a study at the University of Florida, Gainesville, FL. Complex partial seizures were diagnosed in 43% and generalized epilepsy in 57%. Sixty percent were seizure-free during the 56-day test period; 83% were on anticonvulsant medications; and 20% were also taking methylphenidate, except for 72 hours prior to the sleep study. Abnormal sleep architecture, breathing abnormalities, and excessive daytime sleepiness were frequently encountered, and 24 (80%) patients showed obstructive hypopneas or apneas with associated sleep disruption, as recorded by overnight polysomnograms. Parents' reports indicated significant problems with inattention/hyperactivity in children with epilepsy. Behavioral problems were related to concomitant sleep disturbance and not to the severity or type of epilepsy. Correlation analyses of sleep and behavior problems indicated a significant relation between inattention/hyperactivity on the Connors' Parent Rating Scale and REM latency ( $P<0.01$ ) and periodic limb movement arousal (PLMA) index ( $P<0.05$ ); between oppositional/externalizing behavior measure (Eyberg Child Behavior Inventory) and REM latency ( $P<0.05$ ); and between the depression measure (Children's Depression Inventory) and REM latency ( $P<0.05$ ), PLMA index ( $P<0.01$ ), and length of apnea ( $P<0.01$ ). An initial sleep history in children with epilepsy may reveal the need for overnight polysomnography and may aid in the diagnosis and treatment of sleep disturbances and comorbid behavioral problems. (Becker DA, Fennell EB, Carney PR. Daytime behavior and sleep disturbance in childhood epilepsy. *Epilepsy Behav* 2004;5:708-715). (Respond: E-mail: [dbecker@hp.ufl.edu](mailto:dbecker@hp.ufl.edu)).

**COMMENT.** The main findings in the above study are as follows: 1) children with epilepsy frequently suffer from sleep disorders and excessive daytime sleepiness; 2) they have a significantly increased prevalence of inattention/hyperactivity; and 3) associated behavior problems are not directly related to the severity of epilepsy but rather to the concomitant sleep disturbance.

### **Failure of sleep deprivation to increase tendency to epileptiform discharges in EEG.**

The effects of sleep, standard sleep deprivation (SSD), partial sleep-deprivation (PSD)(awake for 2 hours later the night before the EEG), and no sleep deprivation (NSD) on the odds of an epileptiform abnormality in outpatient pediatric EEGs was studied at Cincinnati Children's Hospital Medical Center, OH, during two-2-month periods. Of 820 EEGs recorded, sleep occurred in 22% of NSD, 44% of PSD, and 57% of SSD. Neither the presence of sleep nor the use of PSD or SSD protocols increased the odds of epileptiform EEGs. The authors conclude that sleep deprivation, posing a burden on both parent and child, should not be used routinely to increase the yield of pediatric EEGs. (Gilbert DL et al.