

COMMENT. ADHD is frequently associated with tics/Tourette syndrome, occurring in 50% of TS patients (Ped Neur Briefs Nov 2001), and often causing more disability than the tics (Spencer et al, 1995). Neurobiologically, the two disorders appear to be independent (Baumgardner et al, 1996; Ped Neur Briefs Jan 2002;16:6-7), but etiologically, the precipitation or exacerbation of tics in patients with ADHD is often attributed to treatment with central nervous system stimulants, especially methylphenidate (MPH) (Denckla et al, 1976; Millichap, 1999). Tics occurring during MPH treatment are dose related, occurring mainly with larger doses.

Despite the evidence linking TS to MPH, recent studies have tended to minimize the risk and causal relationship (Law, Schachar, 1999). In the present placebo-controlled study and report, the authors conclude that their findings fail to support recommendations to avoid MPH in children with ADHD and co-morbid tic disorder. Symptoms of ADHD are benefited by MPH to the same degree as that generally observed in subjects with primary ADHD. A worsening of tics during MPH therapy, that limits an increase in dosage in more than one third, is not significantly different from that observed during treatment with placebo or clonidine. Notwithstanding the rare reports of cardiac irregularities and fatalities following the combined use of MPH and clonidine in the treatment of comorbid ADHD and tics/Tourette syndrome, the authors advocate further trials of combination therapies.

Statistically, these findings are impressive and favor the acceptability of stimulant use in children with ADHD and tics/TS (Nass R, Bressman S. Editorial. *Neurology* 2002;58:513-514). The addition of clonidine to stimulant therapy remains controversial, and is best decided on an individual basis (Nass, Bressman, 2002) or avoided, pending prospective and cardiac monitored, long-term studies. In practice, it is prudent to monitor for tics during treatment of ADHD with stimulant medications, and if treatment is considered essential, dosage should be conservative in patients with a history of co-morbid tics/TS (Millichap JG. Attention Deficit Hyperactivity and Learning Disorders PNB, 2001).

**Movement control of manipulative tasks in patients with Gilles de la Tourette syndrome** is deranged, in studies of force regulation during action patterns, and functional imaging of secondary motor areas. (Serrien DJ et al. Brain Feb 2002;125:290-300).

## **SLEEP-DISORDERED BREATHING AND SYMPTOMS OF ADHD**

The frequency of sleep-disordered breathing (SDB) among children with inattention and hyperactivity was determined in 866 patients, aged 2.0 to 13.9 years (mean; 6.8 yrs), evaluated in two general pediatric clinics at the University of Michigan and University of Pittsburgh. A Pediatric Sleep Questionnaire, for snoring, sleepiness, and risk of SDB, and two behavioral measures (an inattention/hyperactivity scale (IHS) from DSM-IV, and the hyperactivity index (HI) of the Conners' Parent Rating Scale) were completed on each patient. Habitual snoring was associated with a high IHS score (>1.25), and showed a significant association with a high HI score (>60), reflective of hyperactive behavior; 22% of habitual snorers had HI>60, whereas only 12% of nonhabitual snorers had HI>60. Snoring, daytime sleepiness, and SDB scores showed significant associations with IHS and HI. The link between snoring and behavior was strongest for young boys <8 years old. In contrast, sleepiness and SDB showed similar associations in all age- and sex-defined groups. (Chervin RD, Archbold KH, Dillon JE, et al. Inattention, hyperactivity, and symptoms of sleep-disordered

breathing. Pediatrics March 2000;109:449-456). (Respond: Ronald D Chervin MD MS, Michael S Aldrich Sleep Disorders Laboratory, 8D8702 University Hospital, Box 0117, 1500 E Medical Center Dr, Ann Arbor, MI 48109).

COMMENT. Inattention and hyperactive behavior, cardinal symptoms of ADHD, may be associated with increased daytime sleepiness, snoring and other symptoms of sleep-disordered breathing. Daytime sleepiness is linked to hyperactive behavior in boys and girls of all ages, whereas the association of snoring and behavior is limited to boys under 8 years of age. Questions regarding sleep habits and snoring are important in the evaluation of children with symptoms of ADHD. A possible causal relationship needs further study.

The causes of sleep problems in children with ADHD include stimulant medications, anxiety disorder, and environmental behavioral sleep deprivation (Trommer BL, et al. Ann Neurol 1988;24:322). Objective measurements of sleep habits, such as polysomnography and actigraphy, have shown conflicting results, while parental ratings reveal an increased prevalence of sleep problems in children with ADHD. The child's own perspective of sleep habits correlate with those of the parents ( see Ped Neur Briefs June 2000;14:47). If upper airway obstruction is excluded as a cause of snoring and sleep-disordered breathing, the substitution of clonidine for stimulant medication should be considered in ADHD children.

## STIMULANT EFFECTS ON AGGRESSIVE BEHAVIOR AND ADHD

The effect of stimulants on overt (physical assault or temper outburst) and covert (cheating, lying, stealing, vandalism) aggression-related behaviors in children with ADHD was determined by literature meta-analysis at the University of Massachusetts Medical School and Northeastern University, Boston. A review of 28 published reports, 1970-2001, revealed 28 and 7 independent effects of overt and covert aggression, respectively. Stimulants had significant, moderate to large effects on aggression-related behaviors, separate from and of equal magnitude to their effects on symptoms of ADHD. Girls responded equally as well as boys. Dose had no significant relation to effect size, but duration of treatment had a significant positive correlation. (Connor DF, Glatt SJ, Lopez ID, Jackson D, Melloni RH Jr. Psychopharmacology and aggression. I: A meta-analysis of stimulant effects on overt/covert aggression-related behaviors in ADHD. J Am Acad Child Adolesc Psychiatry March 2002;41:253-261). (Reprints: Dr Connor, Department of Psychiatry, 7th Floor, Room 57-850, University of Massachusetts Medical School, 55 Lake Ave, North, Worcester, MA 01655).

COMMENT. Treatment with stimulants is effective in the control of aggressive-related behaviors in children with ADHD and co-morbid conduct disorders.

**Psychiatric comorbidity in preschool children with ADHD.** In a study of 165 patients aged 4 to 6 years compared to 381 aged 7 to 9 years, the preschoolers had similar substantial rates of impairment in school, social, and overall functioning to those in school-age children. (Wilens TE, Biederman J, Brown S et al. Psychiatric comorbidity and functioning in clinically referred preschool children and school-age youths with ADHD. J Am Acad Child Adolesc Psychiatry March 2002;41:262-268). These findings support an early intervention treatment program for preschoolers presenting with ADHD.