

# Severe Apnea Linked to CNS Abnormalities

BY KATE JOHNSON  
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Children with severe obstructive sleep apnea demonstrate decreased IQ and other neuropsychological deficits, and have metabolic brain abnormalities that can be seen on imaging, indicating possible neuronal injury, according to a new study.

"We speculate that untreated [obstructive sleep apnea] could permanently alter the trajectory of a developing child's ultimate cognitive potential, resulting in a lifetime of health and economic impacts," wrote Dr. Ann C. Halbower of Johns Hopkins University, Baltimore, and her colleagues in the August 22 issue of the global online journal *Public Library of Science Medicine*.

The findings do not necessarily indicate a causal relationship between obstructive sleep apnea (OSA) and neuronal abnormalities, they noted. "It remains to be determined if early identification and treatment can reverse the neuronal and performance deficits," the authors wrote. However, the findings show altered neuronal metabolites in both the hippocampus and right frontal cortex of children with OSA.

"This is truly concerning because we saw changes that suggest brain injury in areas of the brain that house critical cognitive functions, such as attention, learning, and working memory," Dr. Halbower said in a written statement. The cross-sectional study included 19 children with moderate-severe OSA (defined as an apnea-hypopnea index of 8 or higher as measured by polysomnogra-

phy) and 12 healthy, nonsnoring children as controls. The groups were matched for age, ethnicity, gender, and socioeconomic status.

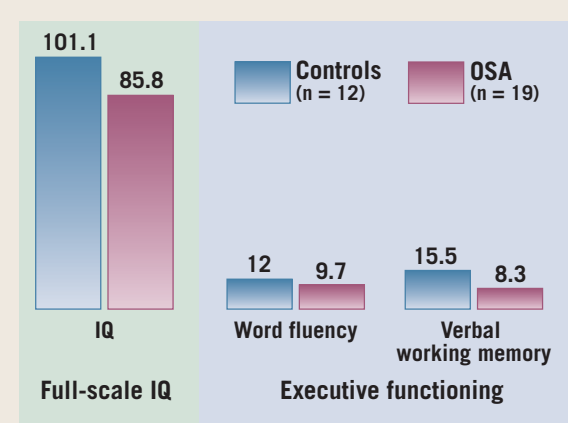
Neuropsychological evaluations performed on all subjects revealed that children with OSA had significantly lower scores, compared with controls, on full-scale IQ, and lower performance on measures of executive function, including verbal working memory and word fluency. There were no significant differences between the groups on any other neuropsychological variables, although a trend toward decreased visual-spatial memory and verbal memory in children with OSA might have gained statistical significance with larger numbers, the authors noted. (See box.)

A subset of 26 out of 31 subjects underwent one or two proton magnetic resonance spectroscopy (MRS) studies to detect both steady-state levels and ratios of three brain metabolites: *N*-acetylaspartate (NAA), choline (Cho), and creatine (Cr).

Single-voxel MRS comparisons of the left hippocampus in six children with OSA and six controls showed that the OSA group had a significant decrease in hippocampal NAA:Cho ratios, and a significant increase in Cho:Cr, "indicating abnormal neuronal metabolism in the static state," the authors noted. MRS imaging of cortical structures showed a significant decrease in the NAA:Cho ratio in the right frontal cortex of seven children with OSA, compared with six controls.

There were no significant differences in cerebellar Cho:Cr or NAA:Cho ratios in five controls and seven children with

## Children With OSA Have Lower Mean IQs And Measures of Executive Function



Source: Dr. Halbower

OSA—although with larger numbers the latter ratio might have reached significance, the authors suggested.

The OSA subjects were significantly more overweight or obese than controls. "If obesity and [sleep-disordered breathing] interact, these combined problems, as well as lifestyle factors linked with obesity (such as television time), may play an important role in exacerbating neuropsychological impairments associated with sleep apnea," they wrote.

# Asthma Survey Reveals Communication Gaps Between Physicians and Parents

BY PATRICE WENDLING  
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MONTREAL — There is a disconnect in communications between physicians and parents of children with asthma, according to an analysis of data from a new global asthma survey.

Parents and physicians disagree on the amount of time dedicated to asthma education in the office; who initiates discussion about medication side effects; and the level of treatment compliance with asthma medication.

The North American pediatric findings of the Global Asthma Physician and Patient (GAPP) study also confirm what most physicians already know: Asthma medication compliance is low; patients with poor compliance experience more symptoms; and side effects lead patients to switch or drop medications.

The authors conclude that patient compliance and outcomes could be enhanced through better physician-patient communications and asthma education, and the availability of new treatment options with lower side-effect profiles, Dr. Ronald Dahl of Aarhus (Denmark) University Hospital, and his associates on the GAPP Survey Working Group reported in a poster at the Seventh International Congress on Pediatric Pulmonology.

The GAPP survey is the first-ever global quantitative survey to uncover asthma attitudes and treatment practices among patients and physicians.

The survey was conducted between May and August 2005 in 16 countries and included a total of 5,482 online and telephone interviews with 1,017 parents of children diagnosed with asthma, 1,006 physicians who treat children with asthma, 1,726 adults over 18 years of age with asthma, and 1,733 physicians who treat adults.

The study, which was supported by an educational grant from Altana Pharma and conducted in cooperation with the World Allergy Organization and American College of Allergy, Asthma, and Immunology, was sufficiently powered to ensure statistical significance globally and in each country.

The pediatric analysis presented here was based on 618 interviews conducted in North America among 314 parents and 304 physicians.

Among parents interviewed, 62% reported their children's asthma as mild; 33% as moderate; and 5% as severe. In the 12 months before the interview, parents reported several events demonstrating poor asthma control such as making an unscheduled visit to their doctor (34%), going to the emergency department (11%), and admission to the hospital (5%), the authors reported.

According to parents, physicians don't discuss specific asthma management issues such as the development of an individual management plan (66%); correct inhaler technique (69%); and keeping daily symptom/medication diaries (25%). In every case, physicians' perceptions of the incidence of

these discussions were higher (90%, 97%, 53%, respectively).

Consistently, parents also perceive less time is spent on asthma education than do physicians. While 18% of parents reported that during a typical office visit, no time is spent on asthma education, about 84% of physicians report spending at least half of their office time on education.

Overall, 27% of parents answered "false" or "not sure" when asked whether mild asthma attacks could be fatal, which demonstrates a general lack of understanding about the disease, the authors reported. Global findings from the survey indicate that treatment compliance increased with the level of asthma education, a trend that also was seen in local results.

Of those patients with asthma who take or had taken asthma medication, 37% of parents reported never discussing short-term side effects such as fungal infection, sore throat, or hoarseness with their physicians; and 55% reported never discussing long-term effects including weight gain, weakening of the bones or changing bone density, cataracts, or glaucoma. This compares with physician reports of 1% and 6%.

A similar disparity was seen regarding lack of parental awareness of both short- and long-term side effects of inhaled corticosteroids.

More information on the GAPP study findings is available at [www.gappsurvey.org](http://www.gappsurvey.org).

## Is Drop in Sleep Connected to Obesity?

Shortened nightly sleep may help explain the rise in childhood obesity because sleep deprivation can disrupt levels of key hormones that regulate appetite and suppress physical activity, an endocrinology researcher reports.

Encouraging longer nightly sleep among children and adolescents should be considered as a component in any antiobesity campaign, according to Dr. Shahrhad Taheri of the University of Bristol, England (*Arch. Dis. Child.* 2006 Oct. 19 [epub doi:10.1136/adc.2005.093013]).

Parents should encourage earlier bedtimes and longer sleep by taking such measures as enforcing strict bedtimes and wake times; providing a quiet, dark, and relaxing bedroom environment; avoiding large meals near bedtime; and removing computers, electronic games, and mobile phones from bedrooms, he said.

Even sleep deprivation early in life may contribute. In the 1990s, the Avon Longitudinal Study of Parents and Children in the United Kingdom linked short sleep duration at 30 months with obesity at age 7, according to Dr. Taheri.

Although most of the data linking disrupted sleep patterns with obesity are cross-sectional and do not prove that the former causes the latter, sleep deprivation can contribute to physiologic changes that could lead to obesity.

For example, sleep deprivation can reduce levels of the hormone leptin, which signals an energy deficit, and increase levels of ghrelin, which may signal hunger, Dr. Taheri wrote. Fatigue stemming from sleep deprivation also can discourage physical activity, increasing the body's caloric surplus. And longer waking hours can increase opportunities to eat, also increasing the caloric surplus.

Despite this possible link, Dr. Taheri said it might be difficult to prove unequivocally a causal relationship between short sleep duration and obesity.

—Jonathan Gardner