

Evidence Based Sleep Medicine—Is Pediatric Sleep Medicine Ready?

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Commentary on Goodwin JL; Kaemingk KL; Mulvaney SA et al; Clinical Screening of School Children for Polysomnography to Detect Sleep-Disordered Breathing—the Tucson Children’s Assessment of Sleep Apnea Study (TuCASA); J Clin Sleep Med 2005;1(3):247-254

Sleep medicine physicians are strongly committed to provide optimal care for their patients. The foundation of optimal care is evidence-based sleep medicine resulting from rigorous basic and clinical research. Numerous practice parameter papers attest to this commitment and reflect the advancement of the field of sleep medicine. These primarily have been based on clinical research in adults and have addressed issues related to sleep disorders in adults. Current practice parameters are valuable models for the field of pediatric sleep medicine. The issues in pediatric sleep medicine share common characteristics to those observed in adults, but are unique because of the developmental features of childhood sleep disorders. The field of pediatric sleep medicine is relatively young, but no less vibrant in respect to its enthusiasm and productivity. There is a need to establish an evidence basis for the care of children with sleep problems.

In this issue of the *Journal* Goodwin et al¹ underscore the readiness to address the clinical problems of the field of pediatric sleep medicine through an evidence-based approach. They address an important clinical problem—namely, which elementary school-aged children should be referred for overnight polysomnographic evaluation of sleep-disordered breathing (SDB). In 2002 the American Academy of Pediatrics presented clinical practice guidelines for the diagnosis and management of childhood obstructive sleep apnea syndrome.² This statement noted that there were very few randomized controlled studies upon which to base recommendations. Among the recommendations that were made were the following: “1. All children should be screened for snoring. ... An affirmative answer should be followed by a more detailed evaluation...4. Thorough diagnostic evaluation should be performed. History and physical examination have been shown to be poor at discriminating between PS (primary snoring) and OSAS (evidence is strong). Polysomnography is the only method that quantifies ventilatory and sleep abnormalities and is recom-

mended as the diagnostic test of choice...” Characteristics of high-risk children were outlined and a flow diagram for decision-making was provided. However, this report did not resolve the dilemma of determining who of the vast majority of snoring children should be referred for polysomnography. Taken to the extreme, based on the 2000 census and a snoring prevalence of 3% to 12%, 1.8 to 7.2 million children might require overnight polysomnography. This would require 1000 to 4000 pediatric sleep laboratories performing four studies per night seven nights a week for one year at a cost of 2-7 billion dollars. Despite the improved availability of pediatric sleep laboratories, this is an improbable scenario. Pediatricians, otolaryngologists, and family practice physicians may be less “uncertain” in their selection of children for overnight polysomnography despite the lack of an evidence basis. For example, Weatherly et al, have described how otolaryngologists approach SDB in children.³ They observed that SDB has overtaken recurrent throat infections as the major indication of adenotonsillectomy. Less than 10% of children suspected of having SDB had any objective testing prior to adenotonsillectomy and less than 5% had overnight polysomnography. Poor learning, poor attention and memory, and learning problems were considered to be important relative indications for surgery 3%-14% of the time. These findings suggest otolaryngologists and referring pediatricians do not use objective testing, i.e. polysomnography, as part of the evaluation of most children prior to adenotonsillectomy. This decision-making concerning children at risk for SDB depends on clinical symptoms and signs including daytime behavioral and cognitive problems for which there is no evidence basis.

The article by Goodwin et al in this issue aims to identify an evidence basis for decision-making in the clinic as whether or not to refer a child for polysomnography because of a high likelihood of significant SDB. They studied a large community sample of children and used measures that can be obtained easily in the out patient clinical setting. They defined SDB on the basis of polysomnographic findings (RDI > or equal to 1 and a 3% oxygen desaturation) that have been shown to be associated with a significant clinical impact rather than an arbitrary RDI. This is a highly desirable approach to determine practice parameters that are useful in “real life” clinical settings. Snoring, excessive daytime sleepiness, and learning problems occurred commonly

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in children with SDB, and were highly specific, but not sensitive for the presence of SDB in elementary school children. These conclusions are similar to those of the 2002 APS position paper. The authors do provide some guidance for the practitioner by noting that for those children with persistent and severe symptoms polysomnography may be indicated.

The failure to identify clinical symptoms with sufficient sensitivity for the presence of SDB in children is disappointing. However, combinations of symptoms such as snoring and male gender, snoring and excessive daytime sleepiness, and snoring and learning problems had specificities approaching 1. Positive likelihood ratios for snoring, learning problems, and symptoms combined with snoring (snoring and male; snoring and learning problems; and snoring and excessive daytime sleepiness) were observed. These findings provide an evidence basis for the identification of those children not requiring polysomnography for the diagnosis of SDB. However, it is unclear that those children with severe SDB and at risk for postoperative complications would be identified for referral for polysomnography. The limitations of this study noted by the authors primarily relate to the identification of SDB in children. These reflect variable clinical practices and the absence of a consensus concerning the use of in-home unattended polysomnography, measurement and use of end tidal CO₂ and nasal pressure, identification of hypopneas, and definition of SDB. These limitations are not unique to this article, but in general reflect the current practice of sleep medicine as it relates to SDB in children. A Pub Med search, “children and sleep apnea, English language”, for the years 2000-2005 identified 604 articles. Of these, 85 articles also considered cognitive and behavior consequences of SDB. This growing body of knowledge concerning SDB and its consequences in children, along with the models of existing sleep medicine practice parameters support the development of an evidence basis for the evaluation and diagnosis of SDB in children. A growing body of research emphasizes the significant impact of sleep disorders, whether SDB or other sleep problems, not only on the sleep of children but on their general health and quality of life. Pediatric sleep medicine is ready for evidence-based medicine.

REFERENCES

1. Goodwin JL, Kaemingk KL, Mulvaney SA, Morgan WJ, Quan SF. Clinical screening of school children for polysomnography to detect sleep disordered breathing—the Tucson Children’s Assessment of Sleep Apnea Study (TuCASA). *J Clin Sleep Med* 2005; 1: 247-54.
2. American Academy of Pediatrics. Clinical practice guideline: diagnosis and management of childhood obstructive sleep apnea syndrome. *Pediatrics* 2000; 109:704-12.
3. Weatherly RA, Mai EF, Ruzicka DL, Chervin RD. Identification and evaluation of obstructive sleep apnea prior to adenotonsillectomy in children: a survey of practice patterns. *Sleep Med.* 2003;4:297-307.