

## Committee or Task Force Report

## Role of the Allergist-Immunologist and Upper Airway Allergy in Sleep-Disordered Breathing

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**BACKGROUND:** Sleep-disordered breathing in general and obstructive sleep apnea in particular are commonly encountered conditions in allergy practice. Physiologically, nasal (or nasopharyngeal) obstruction from rhinitis, nasal polyposis, or adenotonsillar hypertrophy are credible contributors to snoring and nocturnal respiratory obstructive events. Nevertheless, existing practice parameters largely relegate the role of the allergist to adjunctive treatment in cases of continuous positive airway pressure intolerance.

**OBJECTIVES:** To survey active American Academy of Allergy, Asthma & Immunology members regarding their perceptions and practices concerning sleep-disordered breathing in adult and pediatric patients with rhinitis, and to review the medical literature concerning this connection to identify therapeutic implications and research gaps.

**METHODS:** Members of the Work Group on Rhinitis and Sleep-disordered Breathing composed and distributed a Web-based clinically oriented survey to active American Academy of Allergy, Asthma & Immunology members in mid-2015. The group, in addition, conducted an English-language literature review using PubMed and other sources.

**RESULTS:** Survey results were returned by 339 of 4881 active members (7%). More than two-third of respondents routinely asked about sleep problems, believed that sleep-disordered breathing was a problem for at least a "substantial minority" (10%-30%) of their adult patients, and believed that medical therapy for upper airway inflammatory conditions could potentially help ameliorate sleep-related complaints. Literature review supported the connection between high-grade nasal congestion/adenotonsillar hypertrophy and obstructive sleep apnea, and at least in the case of pediatric patients, supported the use of anti-inflammatory medication in the initial management of obstructive sleep apnea of mild-to-moderate severity.

**CONCLUSIONS:** Clinical allergy practice and the medical literature support a proactive role for allergists in the diagnosis and management of sleep-disordered breathing. © 2016 American Academy of Allergy, Asthma & Immunology (J Allergy Clin Immunol Pract 2016;■:■-■)

**Key words:** Adults; Allergic rhinitis; Adenotonsillar hypertrophy; Children; CPAP; Epidemiology; Nasal polyposis; Obstructive sleep apnea; Pathophysiology; Sleep-disordered breathing; Therapy

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Conflicts of interest: F. M. Barody has received consultancy fees from Allergan and GlaxoSmithKline; is employed by the University of Chicago Medicine; has received research support from the National Institutes of Health and Meda; and has received lecture fees from Meda. T. Craig is a past Interest Section Leader for the American Academy of Allergy, Asthma & Immunology; an American Lung Association of Pennsylvania Board Member; a US Hereditary Angioedema Association Advisory Board member; on the Alpha-1 Foundation Clinical Research Center Board; has received consultancy fees from CSL Behring, Dyax, Shire, Merck, Biocryst, Bellrose, Merck, and Novartis; has received research support from CSL Behring, Shire, Dyax, Pharming, Merck, Genentech, GlaxoSmithKline, Grifols, Novartis, Sanofi Aventis, Boehringer Ingelheim, and Biocryst; has received lecture fees from CSL Behring, Dyax, Shire, and Grifols; and is coinvestigator for Asthmanet, National Heart, Lung, and Blood Institute. S. Friedlander has received lecture fees from Teva and Merck. The rest of the authors declare that they have no relevant conflicts of interest.

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Sleep-disordered breathing (SDB) spans a spectrum of diseases including snoring, upper airways resistance syndrome, and obstructive sleep apnea (OSA). SDB in general and OSA in particular are highly prevalent conditions in adult and—increasingly—in pediatric populations.<sup>1,2</sup> SDB is frequently found as a comorbid condition in upper airway allergy, including in patients with rhinitis and rhinosinusitis.<sup>2-7</sup> In spite of this fact, clinical guidelines from the American Academy of Sleep Medicine for the diagnosis and management of OSA relegate the role of the allergist to that of adjunctive support. Although these guidelines recommend examination for nasal abnormalities ("polyps, [septal] deviation, [nasal] valve abnormalities, turbinate hypertrophy"), medical treatment for rhinitis is recommended only in the context of intolerance to (or ineffectiveness of) continuous positive airway pressure (CPAP) due to high-grade nasal congestion.<sup>8</sup>

The perspective of allergists, however, appears to place more "upstream" emphasis on upper airway allergic conditions. Numerous studies link nasal congestion (airflow obstruction; a cardinal manifestation of rhinitis) with mouth breathing, snoring, and in susceptible individuals, OSA.<sup>9-13</sup> Furthermore, in pediatric populations, adenotonsillar hypertrophy (ATH), a frequent accompaniment to atopy, also adversely affects upper airway function and is linked to OSA, independent of rhinitis

**Abbreviations used**

AAAAI- American Academy of Allergy, Asthma &amp; Immunology

ADHD- Attention deficit/hyperactivity disorder

AHI- Apnea-hypopnea index

AR- Allergic rhinitis

ATH- Adenotonsillar hypertrophy

CPAP- Continuous positive airway pressure

NAR- Nonallergic rhinitis

OSA- Obstructive sleep apnea

OSAS- Obstructive sleep apnea syndrome

QOL- Quality of life

SDB- Sleep-disordered breathing

status.<sup>14-19</sup> SDB in children can have profound behavioral consequences, including daytime somnolence and attention deficit/hyperactivity disorder (ADHD), making its early recognition and effective treatment imperative.<sup>20-22</sup> These links between allergy and SDB highlight the possibility that primary treatment for upper airway allergic conditions may help alleviate SDB symptoms by addressing underlying physiologic abnormalities.

Because allergists may have a unique perspective on SDB, and because important research and practice questions may not be widely articulated, the Rhinitis, Rhinosinusitis and Ocular Allergy Committee of the American Academy of Allergy, Asthma & Immunology (AAAAI) undertook, through its Work Group on Rhinitis and Sleep-disordered Breathing, to (1) survey the AAAAI membership regarding members' experience, attitudes, and clinical practice regarding SDB in adult and pediatric patients with rhinitis and (2) review the published literature on rhinitis, rhinosinusitis, and ATH and its link to SDB. The objective of this project was to serve as an evidence-based resource for providers as they choose among diagnostic and management options, as well as to help prioritize future research needs on the basis of identified literature gaps.

### AAAAI MEMBERSHIP SURVEY

A 16-item questionnaire was drafted by the work group and in mid-2015 was distributed electronically to 4881 AAAAI members. The questionnaire asked respondents to indicate their scope-of-practice (adult, pediatric, or both), and, depending on the response to this question, presented them with a series of patient-age-appropriate questions pertaining to their clinical experience and diagnostic and therapeutic practice.

Responses were received from 339 members (7%), including 293 from the United States, 14 from Canada, and 32 from other countries. Of the respondents, the vast majority (82%) treated both adults and children, with 9% each treating children or adults only. Results appear in **Tables I-IV**. Given the relatively low response rate and the fact that a comparison of the practice characteristics of responders and nonresponders was not possible, it is conceivable that responders self-selected on the basis of their level of interest in this clinical topic.

To summarize, 72% of respondents routinely asked about sleep quality, although only 14% reported using paper-and-pencil screening tests in suspected SDB (**Table I**). Seventy-two percent of respondents also perceived that at least a "substantial minority" (10%-30%) of their adult patients with allergy manifested symptoms of SDB, and 70% "often" deferred polysomnography pending possible symptomatic response to medical treatment (**Table II**). Among respondents evaluating children with suspected

**TABLE I.** Survey results: Practice characteristics of 339 responding AAAAI-member allergists/immunologists

Characteristic	n (%)
Country of residence	
United States	289 (86)
Canada	14 (4)
Other	33 (10)
Age group treated	
Adult + pediatric	277 (82)
Adult only	32 (9)
Pediatric only	30 (9)
Routinely query SDB symptoms?	
Yes	241 (72)
No	96 (28)
Use hardcopy screening tools?	
Yes	48 (14)
Epworth	36 (10)
STOP-BANG	2 (1)
Other	1 (3)
No	289 (86)

STOP-BANG, Snore, Tired, Observed (apnea), high blood Pressure, Body mass index, Age, Neck circumference, and Gender.

OSA and ATH, 60% used anti-inflammatory medication as initial therapy, although most managed cases in collaboration with an otolaryngologist (**Table III**). Overall, 71% of respondents believed that allergy medication improved sleep quality in at least a "substantial minority" (10%-30%) of their patients; a smaller percentage (44%) believed that immunotherapy was helpful in this regard. Finally, 73% believed that medical therapy improved CPAP tolerance in at least a subset of patients with rhinitis (**Table IV**). The attitudes and practices reflected in this limited sample of respondents reflect a more active emphasis on the role of the allergist in SDB than do published sleep guidelines.

### LITERATURE REVIEW

The literature review began with an English-language PubMed search (("obstructive sleep apnea" OR "sleep-disordered breathing") AND (rhinitis)) conducted in October 2014, initially yielding 59 relevant references, which was augmented with pediatric (and other) citations familiar to the coauthors, as well as selected interim publications discovered during the 18 months of project activity. The literature summary that follows is a collective project organized by subject—including prevalence and demographic characteristics, pathophysiology, clinical evaluation and management, and unique pediatric considerations.

### Prevalence and demographic characteristics

SDB is a common manifestation in metabolic syndrome, but is not limited to those who are elderly, obese, diabetic, hypertensive, and with cardiac disease.<sup>23,24</sup> In the elderly, SDB is seen in as many as 60% of individuals studied. The prevalence is much lower in children and young adults. In general, the prevalence of SDB in children is estimated to be approximately 2%; however, many think this is a gross underestimation because of a lack of consensus of the diagnostic criteria for SDB in children.<sup>25</sup> Furthermore, in certain cohorts, such as those with craniofacial abnormalities, Down syndrome, ATH, obesity, and rhinitis, the

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