EDITORIAL

The Nose and Sleep-Disordered Breathing

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ABSTRACT

The influence of nasal obstruction on the pathogenesis of sleep-disordered breathing (SDB) has not yet been clearly defined. Similarly, a lack of data about the long-term effect of nasal surgery on snoring and obstructive sleep apnea keeps discussion of this topic controversial. This special issue of *Sleep and Breathing* presents four review articles that try to elucidate the complex interrelationship between the nose and SDB. An outstanding review article opens our eyes to the fascinating palette of the activities of nitric oxide, focusing on its inseparable connection to obstructive sleep apnea. Another summarizes data on the role of the nose in the pathophysiology of SDB and the slow progress concerning rhinologic treatments for SDB. The part of nose in the diagnostics of SDB is treated in a third article that also focuses on acoustic reflectometry as the newest technical development in the diagnostics of SDB. The last article elucidates the effect of nasal continuous positive airway pressure on the nasal passages including the authors' own data on the relatively poor long-term compliance of nasal continuous positive airway pressure.

KEYWORDS: Nose, nitric oxide, sleep-disordered breathing, rhinosurgery, continuous positive airway pressure, acoustic reflectometry

In the early 1960s, as a young resident in the Otorhinolaryngologic Department of the University of Hamburg, my mentor Rudolf Link (1910–1985) taught me: "When you satisfyingly correct a patient's nasal breathing, he will stop snoring." In those days snoring in adults was mainly a male "privilege" and a social annoyance, while obstructive snoring as a risk for health was not yet established in physicians' thinking. After following up on these operated patients some years later, I found my mentor's statement to be not at all true. A minority of patients had benefited from their nasal surgery and reported a reduction in snoring and an improvement in sleep, but the majority still complained of snoring.

Ten years ago, I read a logical explanation by Hoffstein et al[1] of why our attempts to influence snoring by nasal surgery only are rarely successful: "Neither the site of obstruction during apneas nor the site of generation of snoring is in the nose."

The Nose and Sleep-Disordered Breathing; Editors in Chief, Nikolaus C. Netzer, M.D., Kingman P. Strohl, M.D.; Guest Editor, Wolfgang Pirsig, M.D. *Sleep and Breathing*, volume 7, number 2, 2003. Address for correspondence and reprint requests: Wolfgang Pirsig, M.D., Mozartstrasse 22/1, D-89075 Ulm, Germany. E-mail: wolfgang.pirsig@extern.uni-ulm.de. [1]ENT Department, University Hospital Ulm, Ulm, Germany. Tel: +1(212) 584-4662. 1520-9512,p;2003,07,02,051,052,ftx,en;sbr00229x.

Today, the influence of nasal obstruction on the pathogenesis of sleep-disordered breathing (SDB) has not yet been clearly defined although many reports have been published about this topic. An early observation on the role of the nose in SDB as a diseased organ is attributed to Hippocrates (*de morbis*, liber II, sect V, 33–37) who described snoring as one of the symptoms of nasal polyps. Another early observation on the nasal role in the pathophysiology of SDB was reported by Levinus,[2] who in 1581 wrote that mouth breathing in the supine position causes restless sleep. The early importance of the nose for the therapy of SDB was reported by Cline[3] in 1 patient and Wells[4] in 8 of 40 patients. Both authors found an increase of vigilance following nasal septal surgery.

Apart from the beneficial introduction of nasal continuous positive airway pressure therapy for SDB by Sullivan et al[5] in 1981, the therapeutic progress, especially the evidence-based medical aspects, concerning the nose and SDB is not satisfying.

This is completely different in a new field of research rapidly expanding in the last decade and connected with the two capitals NO, which stand for nitric oxide. NO is generated in the nose and functions as an aerocrine vasodilator in the lung. The outstanding article by James Haight and Per Djupesland in this issue of *Sleep and Breathing* opens our eyes to the fascinating palette of the activities of NO, focusing on the inseparable connection of NO and obstructive sleep apnea.

The article by Thomas Verse and Wolfgang Pirsig tries to summarize data and theories about the importance of the nose in the pathophysiology of SDB and the effectiveness of some rhinologic treatments. The existence of two responder groups can be assumed: a larger one for which the importance of the nose for SDB is negligible and a smaller group for which the nasal influence on SDB seems crucial. One astonishing additional observation of this analysis was the finding that there are not more than about 250 polysomnographically documented cases of patients with obstructive sleep apnea treated only by nasal surgery among several hundred thousand patients with SDB treated by other therapies within the last two decades. Is it because the success rate of nasal surgery for SDB is low and the prediction of individual success is not possible?

The nose is also partly involved in the diagnostics of SDB as is outlined by the contribution of Christian Faber and Luisa Grymer. In their critical review of the diagnostic methods to evaluate the site(s) of pharyngeal obstructions during sleep, the authors show that until now there has been no tool to precisely predict these collapsible pharyngeal site(s) in the individual. In addition, they focus on acoustic reflectometry as the newest technical development in the diagnostics of SDB.

In the last two decades, nasal continuous positive airway pressure (nCPAP) has proved to be the treatment of choice for more severe forms of SDB, although the long-term compliance is not more than 50% due to several side effects. Among them is the effect of nCPAP on the nasal passages, which is reviewed by Jan Hollandt and Malte Mahlerwein. These authors also include their own data of their patients on the relative poor compliance of nCPAP after a mean follow-up of 43 months.

Thus, the study of this issue will show several new details elucidating the complex interrelationship between the nose and sleep-disordered breathing and, on the other hand, the slow progress concerning rhinologic treatments for sleep-disordered breathing.

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