

What is the optimal way of treating these patients today and in the future?

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The association between diseases in the upper airways including the nose, the sinuses, and pharynx and the lower airways, consisting of trachea and the bronchi has been recognised since the early Christian era. Pathological conditions in the two airway compartments are by many regarded as manifestation of the same disease. The mechanisms that may connect the upper and lower airway dysfunction are under investigation. They include:

- *Nasal-bronchial reflex.* Nasal allergen challenge has been observed to increase the lower airway reactivity within few minutes, suggesting a neural connection (1). The involvement of pharyngeal receptors, made hypersensitive by seeding of the inflammatory process, has also been suggested (2)
- *Mouth breathing caused by nasal obstruction.* Improvements in asthma associated with increased nasal breathing may be the result of superior humidification, warming of the inspired air, and decreased inhalation of allergens and cytotoxic substances.
- *Pulmonary aspiration of nasal contents:* Postnasal drainage of inflammatory cells, especially during sleep may also affect lower airway responsiveness.
- *Beta-blockade:* Production of bacterial toxins in the upper airways that induce partial beta-blockade and constriction in the lower.
- *Production in the infected sinus of cytokines and other bronchoconstrictive mediators:* These may be distributed to the lower airways either through the airway lumen or via the bloodstream or the lymphatics.
- *Autonomic imbalance:* Changes in neuronal tone in the effector tissue, release of neuropeptides and interplay with cellular recruitment (3).

There are data that support each of these hypothesis, and any or all of them may be operative (4).

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The link between the upper and lower airways is particularly well documented in patients suffering from nasal polyposis, allergic rhinitis or sinusitis and concomitant asthma as the treatment of the upper airway disorders directly influence on the outcome of the asthmatic disease.

Nasal polyposis and asthma

Nasal polyps are pedunculating processes typically situated in the middle meatus, arising from the mucosa of the narrow clefts and spaces around the outlets from the paranasal sinuses. They are covered by different types of epithelia. The stroma contains more or less dilated vessels, and have a varying density of different cell types such as eosinophils, neutrophils, mast cells, plasma cells and lymphocytes. Goblet cells and intraepithelial glands may also be found (5). The overall prevalence of nasal polyposis varies between 0,3% and 4%. Nasal polyposis may be regarded as the ultimate form of inflammatory disease in the upper airways. It often goes together with inflammatory diseases in the lower airways. Nasal polyposis is associated with asthma in about one third of the cases. Correspondingly, adults with asthma have a highly increased prevalence rate of rhinosinusitis with or without polyps, 30–70%. The diagnosis of asthma usually precedes the diagnosis of nasal polyps. The latter usually appear after a long period of rhinitis (6).

There are conflicting opinions regarding the effects of medical and/or surgical treatment of nasal polyps upon the outcome of asthma. Although no study has specifically evaluated the consequences of medical treatment for nasal polyposis on the course of bronchial asthma, recent studies indicate that surgical removal of the polyps has favourable effects upon the lower airways in asthmatics, and may be essential for the stability and improvement for the asthmatic disease (7). Nasal polyps should primarily be treated with topical nasal steroids. If the treatment fails, short term systemic corticosteroids should be combined with the topical treatment. If corticosteroid therapy alone is not enough to control the polyps, they may be removed endoscopically (8).

Allergic rhinitis and asthma

The prevalence of asthma and allergic rhinitis is increasing in the general population and a high proportion of the patients have coexisting upper and lower airway disease (3, 9, 10). Estimates indicate that 60–80% of the patients with asthma have allergic rhinitis (11) and among individuals with allergic

rhinitis, asthma may be found in as many as 38% of the patients (1). Rhinitis often precedes asthma. Patients with allergic rhinitis and no clinical evidence of asthma commonly exhibit non-specific bronchial hyperresponsiveness. Rhinitis and asthma are clinical syndromes with a range of overlapping pathologies. They appear to represent a continuum of inflammation involving one common airway. Therapeutically, there also appears to be an association between allergic rhinitis and asthma. Intranasal corticosteroids can prevent increase in nonspecific bronchial reactivity and asthma symptoms associated with seasonal pollen exposure (12, 13). Treatment of individuals with cat allergy and concomitant asthma with intranasal steroids led to a significant reduction in both upper and lower airway responsiveness upon allergen exposure (14, 15). Similarly, among patients with perennial allergic rhinitis, daily asthma symptoms, exercise-induced bronchospasm, and bronchial responsiveness to methacholine are reduced after administration of topical nasal corticosteroids (12). Antihistamines, with or without decongestants reduce seasonal rhinitis symptoms, asthma symptoms, and objective measurements of pulmonary function among patients with rhinitis and asthma (12).

Sinusitis and asthma

The coexistence of sinusitis and asthma is well documented (16). The role of sinus disease on the triggering or aggravation of asthma has also been well established (17). However, some reports indicate that there may not be a direct correlation between the extensiveness of sinus disease and the severity of asthma. A recent finding suggests that sinusitis may induce asthma by stimulating eosinophil production and activation and thereby supplying peptidoleucotrienes (LTC₄ and LTD₄) and other asthmagenic eosinophil products (4). Identification of the asthmatic patient with chronic sinusitis using the techniques of history and physical examination including nasal endoscopy and CT scanning can lead to treatment of sinusitis with overall sinus and asthmatic disease improvement. Proper management is first medical, while surgical approaches are reserved for the persistent cases (18). The medical treatment is controversial, but may include nasal saline, topical decongestants, topical steroids, systemic steroids, antihistamines and antibiotics (19). Traditional, more radical surgery have shown good results as to the course of the asthmatic disease, although asthma is reported to negatively affect the outcome of sinus surgery (20). Newer techniques of functional endoscopic sinus surgery are less studied, but expected to result in similar or better outcome.

Individuals with asthma have demonstrated greater overall improvement in general health status after sinus surgery than did other cohorts [21].

Conclusion

The upper and lower airways appears to represent a unity both in health and disease. The mechanisms behind the

co-existence of disorders in the different organ systems can still only partially be explained. However, successful treatment of a diseased organ in the respiratory tract appears to depend on therapeutical considerations and measures not only towards that organ in specific, but towards the health status of the respiratory tract in general.

References

- Corren J. Allergic rhinitis and asthma: how important is the link?. *J Allergy Clin Immunol* 1997;99(2):S781-786.
- Bucca C, Rolla G, Scappaticci E, Chiampo F, Bugiani M, Magnano M, D'Alberto M. Extrathoracic and intrathoracic airway responsiveness in sinusitis. *J Allergy Clin Immunol* 1995;95(1Pt1):52-59.
- Rowe-Jones JM. The link between the nose and lung, perennial rhinitis and asthma-is it the same disease?. *Allergy* 1997;52(36 Suppl):20-28.
- Marney SR. Pathophysiology of reactive airway disease and sinusitis. *Ann Otol Rhinol Laryngol* 1996;105(2):98-100.
- Larsen PL, Tos M. Origin and structure of nasal polyps. In: Mygind N, Lildholdt T, editors. *Nasal polyps; an inflammatory disease and its treatment*. Copenhagen: Munksgaard, 1997:17-30.
- Jankowsky R. Nasal polyposis and asthma. In: Mygind N, Lildholdt T, editors. *Nasal polyps; an inflammatory disease and its treatment*. Copenhagen: Munksgaard, 1997:113-119.
- English GM. Nasal polypectomy and sinus surgery in patients with asthma and aspirin idiosyncrasy. *Laryngoscope* 1986;96:374-380.
- Stammberger H *Functional endoscopic sinus surgery: the Messenklinger technique*. Philadelphia: BC Decker, 1991.
- Rimpela AH, Savonius B, Rimpela MK, Haatela T. Asthma and allergic rhinitis among Finnish adolescents in 1977-1991. *Scand J Soc Med* 1995;23(1):60-65.
- Norrman E, Nystrom L, Jonsson E, Stjernberg N. Prevalence and incidence of asthma and rhinoconjunctivitis in Swedish teenagers. *European Journal of Allergy and Clinical Immunology* 1998;53(1):28-35.
- Greisner WA, Settupane RJ, Settupane GA. Co-existence of asthma and allergic rhinitis: a 23-year follow-up study of college students. *Allergy Asthma Proc* 1998;19(4):185-188.
- Corren J, Adinoff AD, Buchmeier AD, et al. Nasal beclomethasone prevents the seasonal increase in bronchial responsiveness in patients with allergic rhinitis and asthma. *J Allergy Clin Immunol* 1992;90:250-256.
- Aubier M, Levy J, Clerici C, Neukirch F, Herman D. Different effects of nasal and bronchial glucocorticosteroid administration on bronchial hyperresponsiveness in patients with allergic rhinitis. *Am Rev Resp Dis* 1992;146:122-126.
- Wood RA, Eggelston PA. The effects of intranasal steroids on nasal and pulmonary responses to cat exposure. *Am J Resp Crit Care Med* 1995;151(2Pt 1):315-320.
- Grossmann J. One airway, one disease. *Chest* 1997;111(2 Suppl):11S-16S.
- Huang JL, Lin TY, Wang KF. Sinusitis and bronchial asthma in children. *Chung-Hua min Kuo Hsiao Erh Ko i Hsueh Hui Tsa Chih* 1995;36(1):20-23.
- Klossek JM, Dufour X, Desmonts C, Fontanel JP. Asthma and polyposis. *Allergie Immunol* 1998;30(3):69-72.
- Senior BA, Kennedy DW. Management of sinusitis in the asthmatic patient. *Ann Allergy Asthma Immunol* 1996;77(1):6-15.
- Oliviera CA, Sole D, Naspitz CK, Rachlefsky GS. Improvement of bronchial hyperresponsiveness in asthmatic children treated for concomitant sinusitis. *Ann Allergy Asthma Immunol* 1997;79(1):70-74.
- Dinis PB, Gomes A. Sinusitis and asthma: how do they interrelate in sinus surgery. *Am J Rhinol* 1997;11(6):421-428.
- Glicklich RE, Metson R. Effect of sinus surgery on quality of life. *Otolaryngol Head Neck Surg* 1997;117(1):12-17.

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