

Editorial

Allergic rhinitis and allergic asthma: a uniform airway disease?

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The clinical impression of the airway as a single entity was recognized by Bostock (1) in the early 19th century. In recent years, an increasing number of articles have been published on this topic. Epidemiological evidence, treatment studies, and documentation of advanced methods in cellular and molecular biology have been covered in reviews (2–6).

In a retrospective study in a large number of school-children, Rusconi et al. (7) found that patients with wheezing had a ten-fold greater chance of having allergic rhinitis problems compared to control subjects. The longitudinal study of the Settiane group (8), which had a 23-year follow-up, showed that allergic rhinitis at inclusion resulted in a three-fold risk of developing asthma compared to the group without rhinitis symptoms. In a 12-year follow-up Swedish study by Danielsson and Jessen (9) the number of asthmatics in the group with allergic rhinitis was double that of the group without symptoms at inclusion. An almost ubiquitous presence of allergic rhinitis, in patients with allergic asthma, has been reported by Kapsali and coworkers (10).

Further proof of this comes from a recent article by Guerra and colleagues (11). During 2-year follow-up of a large number of patients, rhinitis increased the risk for development of asthma by three times in both allergic and nonallergic patients. They also found a five-fold increase in patients with high IgE levels. The authors conclude that rhinitis is a significant risk factor for developing asthma in both allergic and nonallergic subjects. Consequently there is strong epidemiological evidence in the literature for rhinitis and asthma as a comorbid disease (12, 13). These studies are all in accordance with the article of Linneberg et al. (14) in the present issue of *Allergy*. The authors present a population-based prospective 8-year follow-up study in which they con-

clude that allergic rhinitis and allergic asthma are manifestations of the same disease entity.

When reading and comparing the many different studies on prevalence of allergic rhinitis and asthma, one of the main difficulties is the variety of definitions of the disease (15, 28). Many studies use different types of questionnaires and inclusion criteria and the outcome can thus be a result of misclassification—a fact which is also commented on by the authors.

In the paper by Linneberg et al. (14) the relationship between rhinitis and asthma symptoms was less evident for pollen allergy compared with animal and mite allergy. This is most probably because animal and mite particles are small (2–3 µm) compared with larger pollen grains (10–20 µm). As the nose is able to filter allergen particles sized 10 µm or more, most of the pollen gets stuck in the nasal cavity, leading to an allergy reaction primarily in the nasal mucosa. On the other hand, when pollen allergens are exposed to watery secretion, they can be dissolved, thus reaching the lower airways and inducing asthmatic inflammation (16). The extent of exposition in these cases is also important, as has been shown in thunderstorm-induced asthma (17).

Apart from its filtering function, the nose has an important role in warming and humidifying inhaled air before it enters the lower airway. This is possible because of the highly vascularized mucosa, with a large amount of secretory glands. The importance of the conditioning capacity of the nose in patients with asthma and seasonal allergic rhinitis has been studied by Assanasen et al. (18). They found that noses of subjects with asthma were less able to condition inhaled cold dry air compared with controls. Interestingly the group also published a paper showing that hot humid air partially inhibits the nasal response to allergen provocation (19).

When evaluating the results of a given therapy, in clinical everyday work, practitioners experience the link between the upper and lower airways. Multiple studies have been performed which demonstrate this link (20–23). Crystal-Peters et al. (24) recently carried a retrospective cohort study. The authors conclude that the patients treated for allergic rhinitis had a significantly lower risk of subsequent asthma-related events than those who were not treated.

The coexisting presence of inflammation in the airways in a study on asthmatics with or without rhinitis has been shown by Gaga et al. (25). Using biopsies from the nasal mucosa, they showed that eosinophil infiltration occurred in the nasal mucosa of asthmatic patients, irrespective of any signs of rhinitis or not. Braunstahl et al. (26) used experimental segmental endobronchial allergen-challenge to induce nasal symptoms, as well as induce effects on mast-cell degranulation, and basophil influx into both the nasal and bronchial mucosa. When performing allergen nasal challenges the same authors could show up-regulation of adhesion molecules and a tissue eosinophilia concomitantly in the upper and lower airways (27).

Hence, today we have a number of different meticulously performed human studies that show a relationship between the upper and lower airways. Paradoxically, there are few well-performed animal studies published. There is a need for more experimental animal studies investigating the underlying mechanisms, which have been asked for by Vignola and Bousquet (2).

The article by Linneberg et al. (14) is yet more evidence supporting the hypothesis of a uniform airway disease. The increasing number of epidemiological, therapeutic, and biological implications pinpoint the need for closer clinical cooperation between allergists, ENT-specialists, chest physicians, and paediatricians. An all-embracing evaluation of patients with respiratory diseases is needed. The symptoms of both nasal congestion and secretion might be due to structural anomalies and/or nasal polyposis and could therefore be helped by surgery.

Optimal medical treatment of the upper respiratory tract is a prerequisite for a good therapeutic result in the lower airways. Greater knowledge of the problems of “neighbouring” specialists will benefit the education of different physicians involved in treating the increasing numbers of patients who develop symptoms of the united airways.

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