2.10 Nonallergic Rhinitis and Primary Ciliary Dyskinesia

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2.10.1 Introduction

Rhinitis is defined by the presence of nasal symptoms such as obstruction, itching, discharge and sneezing [1]. According to its skin test and serum immunoglobulin (IgE) pattern, chronic rhinitis has been traditionally classified into “allergic” and “nonallergic”. Nonallergic rhinitis is therefore defined as chronic rhinitis with negative testing for IgE-mediated sensitivity to aeroallergens. At first blush, conditions such as infectious rhinitis or nasal polyposis would fall into this category. However, for most authors these diseases must be excluded, with the focus only on nonallergic, noninfectious rhinitis.

2.10.2 Diagnosis

Clinical features including obstruction, itching, discharge and sneezing (at least two of them for more than 1 h most days) [2], with negative allergic background (history, skin-prick test, serum-specific IgE) are the basic criteria for nonallergic rhinitis (Fig. 2.10.1). However there is no specific test for nonallergic rhinitis, so diagnosis is made by exclusion of allergy, sinus disease, and structural or immune alterations.

However, not every rhinitis with a positive skin test is an allergic rhinitis. There is a group of rhinitises without a clear association between their positive skin tests and their symptoms (e.g. a positive test for a seasonal allergen and a clearly persistent behaviour of the specific rhinitis). Furthermore, in a broad group of patients, mixed pathophysiology (both allergic and nonallergic) can be suspected [3]. Therefore, nonallergic rhinitis actually is a group of syndromes without generally accepted diagnostic criteria, sometimes overlapping when comparing different classifications.

2.10.3 Epidemiology

Although uneven definition standards have made figures variable, it is estimated that 2–4% of the general popula-
2.10.4 Occupational Rhinitis

Occupational rhinitis is an episodic, working-related nasal syndrome characterised by sneezing, nasal obstruction and nasal discharge. It may be due to an IgE-mediated mechanism, which would be a form of allergic rhinitis, or related to nonspecific inflammation of the nose, e.g., exposure to high concentrations of irritating substances, which would be included in the nonallergic rhinitis category. There are many causes of occupational rhinitis, which include grains, laboratory animals, wood dust and latex, and chemicals like platinum salts, acid anhydrides, glues and solvents. Occupational rhinitis may be associated with occupational asthma, a condition that should be further investigated.

Treatment of occupational rhinitis is based on prevention, which can be carried out screening applicants for sensitising work environments. However, in a study performed on laboratory workers, this measure proved inefficient. Environmental control measures like adequate ventilation or the use of masks is another form of prevention. Pharmacologic treatment for occupational rhinitis is similar to treatment for other types of rhinitis, and is based on intranasal and systemic antihistamines, anticholinergic agents, decongestants and intranasal steroids.

2.10.5 Drug-induced Rhinitis

*Rhinitis medicamentosa* is a term reserved for the worsening of nasal obstruction in patients who use nasal decongestants chronically. This condition is of special concern in neonates because rebound nasal obstruction can lead to difficulty in feeding and to respiratory distress. Signs include erythematous nasal mucosa and swollen turbinates. Its pathologic hallmark is interstitial oedema, although hyperplastic goblet cells and increased immunoreactivity for EGFR have been discovered recently. Intranasal steroids have proved to be useful in the management of rhinitis medicamentosa in animal models and in vivo.

A number of drugs are known to cause rhinitis. Among these are:

- Aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs)
  - In about 10% of adult patients with asthma, NSAIDs are able to trigger an asthmatic crisis by means of cyclo-oxygenase inhibition. This may shift the arachidonic acid metabolism to the lipo-oxygenase pathway, increasing leukotriene synthesis.
- Alpha-blockers
- Angiotensin-converting enzyme (ACE) inhibitors
- Beta-blockers
- Chlorpromazine
- Cocaine
- Guanethidine
- Methyldopa
- Oral contraceptives
- Reserpine
- Phentolamine.

2.10.6 Rhinitis and Pregnancy

Pregnancy rhinitis is defined as nasal congestion in the last 6 weeks or so of pregnancy, excluding an allergic or infectious cause, and with complete resolution of the symptoms within 2 weeks after delivery. It affects roughly one out of five pregnancies. An impairment of nasal patency documented by anterior rhinomanometry and an augmented mucociliary clearance has been observed during pregnancy. In addition, there is an increase of nasal obstruction in women during their peri-ovulatory stage of the menstrual cycle, in conjunction with the rise in serum estrogens. The ultimate treatment for this condition is yet to be found. Nasal decongestants, although useful, tend to be overused by patients with pregnancy rhinitis, which carries the risk of developing rhinitis medicamentosa. Corticosteroids have not been found to be effective.

2.10.7 Rhinitis Associated with Physical and Chemical Factors

Chemical and physical factors may be responsible for nonallergic nasal symptoms, although limits between physiological and pathological influence of these factors are difficult to determine. Immersion in cold water has been found to produce nasal obstruction in a side-specific way. Cold, dry air may cause nasal obstruction and increase of secretions, known as “skier’s nose”. (However, total nasal patency [e.g. both nasal cavities] has been found kept at a constant level in skiers performing under cold and dry conditions). Ipratropium bromide can be a useful treatment for this condition.

2.10.8 Food-induced Rhinitis

Spicy foods cause watery rhinorrhea, a phenomenon called “gustatory rhinitis”. This is caused by stimulation of atropine-inhibitable muscarinic receptors, so the syndrome can be treated with intranasal atropine [6].