Rhinosinusitis and Allergies in Elderly Patients

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KEYWORDS

• Rhinitis • Rhinosinusitis • Elderly • Management • Presbynasalis

KEY POINTS

- The anatomy and physiology of the sinonasal tract changes with advancing age, occasionally resulting in symptoms.
- Multiple factors in geriatric patients can lead to a decrease in olfactory function.
- The causes of rhinitis in elderly patients are variable, and treatment should be tailored to the patient's individual needs, medications, and comorbidities.
- Chronic rhinosinusitis management can be more challenging in geriatric patients because of previous treatments and surgeries.

INTRODUCTION

The elderly population has increased in developed countries and, with this, diseases in the geriatric population are becoming increasingly important. It is projected that by the year 2050, individuals older than 65 years will represent 20% of the population in the United States and 25% of the Canadian population.[1,2] Up to one-third of patients seen by an otolaryngologist are older than the age of 65 years.[3] The Canadian population has a mean life expectancy of 81 years of age[4] and they expect a good quality of life as they age.

Although evidence suggests that allergic rhinitis decreases with age, the prevalence of nonallergic rhinitis is higher in the elderly, and rhinosinusitis is the sixth most common chronic disease in the elderly population.[5] Furthermore, elderly patients are often affected by multiple comorbidities, which can be more severe than rhinitis and rhinosinusitis. Nevertheless, poorly controlled rhinitis and rhinosinusitis can act as triggers for respiratory disease exacerbation and affect the patient's quality of life, underlining the importance of assessing and treating these conditions.[6] Of course, a careful

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evaluation of comorbidities and potential drug interactions should be undertaken before prescribing any pharmacologic therapy.

Anatomic and Physiologic Changes with Age

Several changes in nasal physiology, anatomy, and in the immune system occur with advancing age; these changes can influence the onset of rhinitis and rhinosinusitis symptoms in older adults.

The term presbynasalis refers to the changes in the sinonasal tract that occur with age.[7] These changes involve the anatomy, the mucosa, and the viscoelastic properties of nasal secretions.

Anatomy

Fibroconnective tissues become weaker because of collagen fiber atrophy and a decrease in facial musculature; this leads to a loss of tip support and ptosis.[8] There can also be septal cartilage fragmentation and retraction of the columella. These structural changes can decrease nasal airflow and lead to symptoms of nasal obstruction.

Nasal mucosa

There is often atrophy of the nasal mucosa with advancing age caused by a thinning of both the epithelium and the basal membrane,[9] variably affecting nasal airflow and altering mucociliary clearance. These same changes are observed in postmenopausal women.[10] There is a decrease in ciliary beat frequency and mucociliary clearance[11] accompanied by alterations of the microtubules.[7,12] Nasal vasculature also changes as submucosal vessels become less patent, resulting in a decreased ability of nasal structures to warm and humidify inhaled air. Consequently, older individuals are more susceptible to suffering from nasal dryness.[13]

Viscoelastic properties of the secretions

With a decrease in the production and secretion of nasal mucous, there is an increase in the viscosity of secretions, which further contributes to the sensation of dryness and irritation.

The immune system is also affected with age, with 2 major changes noted: immunosenescence and the development of chronic inflammation.[14]

Immunosenescence describes changes in both innate and acquired immunity with age, which can cause an increased susceptibility to infections and autoimmune disorders. These changes include

1. Decreased expression and signaling of toll-like receptors[15]
2. Involution of the thymus gland, resulting in the decreased production and differentiation of naïve T cells, and a decreased responsiveness of T-cell populations[12]
3. Increased production of aberrant antibodies to pneumococcus and other bacteria by B cells.[16]

This process of immunosenescence affects the sinonasal tract, resulting in a greater vulnerability to allergens and pathogens in the elderly population.[7]

With age, the olfactory neuroepithelium also undergoes modifications: it becomes thinner, the density of receptors decreases, and the pattern of receptors changes.[17] These changes are more pronounced in smokers.[18] This results in a decreased sense of smell with age: after the age of 65 years, about 20% of patients present with alterations in their sense of smell and in patients older than 80 years up to 62.5% have alterations in olfaction.[19] There is not only a decrease in the perception of odors but also in distinguishing between different odorants.[20] This decrease adversely affects quality of life because the ability to distinguish flavors and taste diminishes.