

# Age-Related Variations in the Clinical Course and Management of Rhinosinusitis

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**Abstract:** In recent decades, substantial progress has been achieved in diagnosing and treating respiratory tract disorders, particularly various forms of sinusitis — a condition affecting over 20% of the global population. Advances in immunology, genetics, and molecular biology have significantly deepened our understanding of the mechanisms responsible for pathological tissue changes at the cellular level. The development of novel pharmacological agents and improved generations of antibiotics has enabled more effective control over a wide range of infectious pathogens.

**Keywords:** rhinosinusitis, sinusitis, pathology

## Introduction

Rhinosinusitis (RS) is among the most frequent diseases in children but is often underdiagnosed. On average, children experience 6–8 upper respiratory viral infections annually, with approximately 0.5–5% progressing to acute rhinosinusitis (ARS). A certain proportion of these cases may evolve into chronic rhinosinusitis (CRS). This disorder imposes a significant burden on healthcare systems and affects national economies worldwide.

Typical symptoms of ARS in children include nasal obstruction, mucopurulent nasal discharge, and persistent cough that may disturb sleep. Facial pain or headache is more common in older children. Clinically, ARS is defined by symptoms lasting up to four weeks; subacute rhinosinusitis corresponds to a duration of 4–12 weeks, whereas CRS persists for more than 12 weeks.

Rhinosinusitis is characterized as an inflammatory process of the mucosal lining of the nasal cavity and paranasal sinuses, involving the sinus fluids and sometimes the underlying bone tissue. The term *rhinosinusitis* has largely replaced *sinusitis*, reflecting the understanding that nasal mucosal inflammation is almost always present in such cases.

## Discussion

The introduction of microsurgical and minimally invasive techniques has revolutionized the treatment of sinusitis, offering new therapeutic perspectives. However, despite technological advances and modern pharmacotherapy, the overall incidence of rhinosinusitis has not declined. In recent years, an increasing number of cases have been attributed to atypical pathogens and saprophytic microorganisms—especially fungal species—that normally do not cause inflammation in healthy mucosal microbiota.

Diagnosis, treatment, and prevention of odontogenic purulent-inflammatory diseases in the maxillofacial region remain highly relevant in both dentistry and maxillofacial surgery. A differentiated therapeutic strategy targeting specific pathogenetic mechanisms is essential in managing these conditions.

The pathogenesis of maxillary sinusitis is primarily determined by the nature of its etiological factors. Common causes of chronic inflammation of the maxillary sinuses include infectious agents, allergic reactions, mucosal trauma, and local anatomical abnormalities. Functional disturbances in sinus ostia, altered arachidonic acid metabolism, intolerance to nonsteroidal anti-inflammatory drugs, and immune dysregulation also play critical roles in the development of chronic sinus inflammation.

## Chronic Polypous Rhinosinusitis

Chronic polypous rhinosinusitis represents a widespread form of persistent inflammation of the paranasal sinus mucosa and has a significant impact on patients' quality of life. Studies show that the disease occurs 1.5–2 times more frequently in men than in women aged 50–59 years, while its prevalence is similar among men and women aged 30–49 years.

Further epidemiological research is needed to better understand the age-related patterns and progression of polypous rhinosinusitis.

According to G. Z. Piskunov, from a clinical perspective, the following classifications of polypous rhinosinusitis are useful:

1. Polyposis resulting from disrupted nasal and paranasal aerodynamics.
2. Polyposis secondary to chronic purulent inflammation of the nasal and sinus mucosa.
3. Polyposis associated with fungal infection of the mucosa.
4. Polyposis caused by impaired arachidonic acid metabolism.
5. Polyposis linked to congenital syndromes, such as cystic fibrosis and Kartagener's syndrome.

From a morphological standpoint, researchers distinguish several types of nasal polyps: edematous, fibrous, glandular with cystic degeneration, and granulomatous. These morphological differences may arise from both infectious and allergic processes. Infectious polyps are often granulomatous or fibrous due to chronic purulent inflammation leading to degenerative mucosal changes.

Allergic inflammation, in contrast, is typically characterized histologically by edematous thickening of the nasal and sinus mucosa, similar to changes observed in anaphylactic reactions. Japanese studies report that less than 10% of patients with allergic rhinitis develop nasal polyps, though the incidence increases significantly among individuals with aspirin sensitivity or asthma.

## Conclusion

The findings suggest that an effective, comprehensive treatment strategy for rhinosinusitis should consider patient age, disease history, the anatomical structure of the nasal cavity, and the presence of allergic or immunological alterations. Individualized therapeutic correction of these factors is essential for achieving stable and long-term remission.

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