SIR Publishers
CENTER FOR INTERNATIONAL SCIENTIFIC PUBLICATIONS
JOURNAL OF APPLIED MEDICAL SCIENCES
ISSN(Online): 2984-6730
Volume-9, Issue-04, Published |11-06-2026|

Chronic polyposis rhinosinusitis: Early stage diagnosis, modern interpretation of pathogenesis, and prevention strategies for its development.

Authors:

- Abdunazarov Toxirjon Sadulla o'g'li. Assistant at the Department of "Surgical Sciences", Central Asian Medical University. Email: tohirjonabdunazarov102@gmail.com, https://orcid.org/0009-0007-4924-3897
- Otaqulov Otabek Olimjon o'g'li. Assistant at the Department of "Surgical Sciences", Central Asian Medical University. Email: otabekotakulov97@gmail.com, https://orcid.org/0009-0005-2528-8471

Abstract: This article details the complex etiopathogenetic mechanisms of the development of chronic polyposis rhinosinusitis (CRSwNP) and nasal polyps (NP), including Th2-type inflammation, cellular level changes, and the role of biofilms. Standardized scales of nasal endoscopy and computed tomography (CT) (Lund-Mackay, Lildholdt) for detecting the disease at clinical and subclinical stages are analyzed. The mechanisms of local glucocorticosteroids, leukotriene receptor antagonists, and the latest innovative approach, biological therapy (monoclonal antibodies), which play a key role in preventing polyp formation and recurrence, are considered.

Keywords: Chronic polyposis rhinosinusitis (CRSwNP), Th2-endotype, eosinophilia, nasal endoscopy, Lund-Mackay scale, biological therapy, mucociliary clearance, local corticosteroids.

1. Introduction and Relevance

Nasal polyps (NP) are a hyperplastic process resulting from chronic, multifactorial inflammation of the mucous membrane of the nasal cavity and paranasal sinuses. World statistics show that polyposis rhinosinusitis occurs in 1–4% of the general population and in more than 15–20% of patients with bronchial asthma. In modern otorhinolaryngology, the disease is studied not only as a local pathology but within the framework of a systemic inflammatory process of the entire respiratory tract (the concept of united airways). Polyps directly affect patients' quality of life, leading to complications such as reduced work capacity, complete loss of smell (anosmia), impaired sleep quality, and hypoxia. Since the disease is often prone to recurrence even after conservative and surgical treatment, early diagnosis and preventive measures are extremely important.

2. Etiopathogenesis: Phenotype and Endotypes

Recent scientific research requires differentiating polyps not merely as a set of symptoms (phenotype), but based on the cellular and molecular mechanisms (endotype) that cause them.

The following main mechanisms are involved in the pathogenesis of nasal polyps:

- **Th2-type eosinophilic inflammation:** Most polyps occurring in European and American populations are characterized by inflammation mediated by T-helper 2 (Th2) cells. In this process, interleukins (IL-4, IL-5, IL-13) are actively synthesized. Specifically, while IL-5 ensures the proliferation and migration of eosinophils to the mucous membrane, IL-4 and IL-13 stimulate the production of IgE antibodies by local B-lymphocytes.
- **Staphylococcus aureus superantigens:** Staphylococcus aureus toxins provoke a strong immune response (superantigen reaction) in tissues, further intensifying the inflammatory cascade and often leading to the formation of severe, recurrent polyps.
- **Tissue remodeling and biofilms:** During the inflammatory process, an increase in vascular endothelial growth factor (VEGF) leads to increased vascular permeability, and edema

appears in the stroma. Additionally, the formation of bacterial biofilms (a protective membrane of microorganisms) on the surface of the mucous membrane increases the disease's resistance to antibiotics and immune cells.

3. Early Stage Diagnosis (Clinical and Instrumental Approaches)

Detecting the microscopic and early stages of polyp development requires a systematic approach.

3.1. Subjective and Objective Signs In the period when polyps are not yet visible on rhinoscopy, the following micro-symptoms should attract attention: Rhinorrhea lasting more than 12 weeks and resistant to treatment (especially postnasal drip). Early onset of hyposmia (due to swelling in the olfactory receptor area — the olfactory region).

3.2. Nasal Endoscopy (Standardized Assessment) The ostiomeatal complex (middle nasal meatus) is carefully examined using rigid (0°, 30°, 45°) or fiberoptic endoscopes. It is accepted to assess the size of polyps according to the international Lildholdt scale:

- **Grade 0:** No polyps.
- **Grade 1:** Polyps are confined only to the middle turbinate, not extending below (early stage).
- **Grade 2:** Polyps extend below the middle turbinate but do not reach the inferior turbinate.
- **Grade 3:** Polyps completely obstruct the nasal cavity.

3.3. Computed Tomography (CT) CT scanning allows for the assessment of sinus bone architectonics and the volume of pathological tissue. The Lund-Mackay scale (from 0 to 24 points) is used for the quantitative assessment of the level of inflammation. In this system, each sinus (maxillary, frontal, ethmoidal, sphenoidal, and the ostiomeatal complex) is scored as clear (0), partially opacified (1), or completely opacified (2).

3.4. Biomarker Analysis Detection of peripheral eosinophilia (>250-300 cells/mcL) in blood tests and large amounts of eosinophils in the cytology of nasal secretions early confirms the Th2 endotype and serves as an indicator for future biological therapy.

4. Prevention of Polyp Development (Prophylaxis and Conservative Treatment)

Preventing the growth of polyps and their recurrence after surgery involves continuous therapy affecting the disease's etiopathogenesis.

4.1. Intranasal Glucocorticosteroids (INCS) Intranasal corticosteroids (mometasone furoate, fluticasone propionate, budesonide) are considered the international "gold standard" for CRSwNP treatment. They decrease the number of eosinophils by enhancing apoptosis, block the synthesis of cytokines, and reduce vascular permeability. Because their systemic absorption rate into the blood is very low, they can be safely used for long periods (months and years). When we applied local glucocorticosteroids and performed nasal washing procedures on 20 middle-aged patients in the ENT department of FVKTTM. It was observed that the recurrence of polyps decreased in them. Preventive treatment is carried out periodically every 6 months or 1 year.

4.2. Physiological Cleansing and Restoration of Mucociliary Clearance High-volume (200-250 ml), low-pressure nasal washing (nasal irrigation) with isotonic and hypertonic solutions is an integral part of the daily prophylactic profile. This method mechanically removes biofilms, staphylococcal toxins, allergens, and mediators from the mucosal surface and normalizes the activity of the ciliated epithelium (mucociliary clearance).

JOURNAL OF APPLIED MEDICAL SCIENCES
ISSN(Online): 2984-6730
Volume-9, Issue-04, Published |11-06-2026|

5. Conclusion

Early diagnosis and prevention of nasal polyps is one of the complex and highly important tasks in clinical medicine. The disease should be viewed not just as a mechanical obstruction, but as a chronic process accompanied by deep immunological changes. Early detection of the polyposis process using nasal endoscopy and CT, timely prescribed local steroid treatment, and recourse to biological therapy when necessary — is the only scientifically based way to save patients from repeated surgical procedures and fundamentally improve their quality of life.

References (Extended list):

1. Fokkens, W. J., Lund, V. J., Hopkins, C., Hellings, P. W., Kern, R., Reitsma, S., ... & Zwura, J. (2020). European Position Paper on Rhinosinusitis and Nasal Polyps 2020 (EPOS 2020). Rhinology, 58(Suppl S29), 1-464. (Main international guideline).
2. Bachert, C., Han, J. K., Desrosiers, M., Hellings, P. W., Amin, N., Lee, S. E., ... & Mannent, L. P. (2019). Efficacy and safety of dupilumab in patients with severe chronic rhinosinusitis with nasal polyps (LIBERTY NP SINUS-24 and LIBERTY NP SINUS-52): results from two multicentre, randomised, double-blind, placebo-controlled, parallel-group phase 3 trials. The Lancet, 394(10209), 1638-1650.
3. Bousquet, J., Khaltaev, N., Cruz, A. A., Denburg, J., Fokkens, W. J., Togias, A., ... & Zuberbier, T. (2008). Allergic Rhinitis and its Impact on Asthma (ARIA) 2008 update. Allergy, 63(S86), 8-160.
4. Meltzer, E. O., Hamilos, D. L., Hadley, J. A., Lanza, D. C., Marple, B. F., Nicklas, R. A., ... & Zinreich, S. J. (2004). Rhinosinusitis: establishing definitions for clinical research and patient care. Journal of Allergy and Clinical Immunology, 114(6), 155-212.
5. Stevens, W. W., Schleimer, R. P., & Peters, A. T. (2016). Pathophysiology of chronic rhinosinusitis with nasal polyps. In Chronic Rhinosinusitis (pp. 115-131).
6. Ministry of Health of the Republic of Uzbekistan. Clinical protocols for the diagnosis and treatment of diseases in otorhinolaryngology. Tashkent.
7. Lund, V. J., & Mackay, I. S. (1993). Staging in rhinosinusitis. Rhinology, 31(4), 183-184. (Main source for the Lund-Mackay CT scale).
8. Gevaell, A. N., & Kern, R. C. (2021). The Role of Biofilms in Chronic Rhinosinusitis. Otolaryngologic Clinics of North America, 54(1), 1-13.