CLINICAL AND SURGICAL APPROACHES TO CHRONIC RHINOSINUSITIS IN ADULT PATIENTS

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Abstract. *Chronic rhinosinusitis (CRS) is a multifactorial inflammatory disorder of the nasal and paranasal sinus mucosa persisting for more than 12 weeks. It significantly impairs patients' quality of life through persistent nasal obstruction, facial pain, and olfactory dysfunction. The complexity of CRS arises from diverse etiologies, heterogeneous immunopathological mechanisms, and varied clinical presentations, complicating treatment strategies. This study retrospectively analyzes clinical presentations, diagnostic modalities, and treatment outcomes of medical and surgical management in adult patients with CRS. Emphasis is placed on differentiating CRS phenotypes—CRSwNP and CRSsNP—and optimizing individualized treatment. Functional endoscopic sinus surgery (FESS) remains a cornerstone for refractory cases, restoring sinus ventilation and drainage. The findings underscore the importance of integrated care combining medical and surgical approaches for improved patient outcomes.*

Keywords*: Chronic rhinosinusitis, nasal polyps, functional endoscopic sinus surgery, nasal obstruction, sinusitis.*

Introduction

Chronic rhinosinusitis (CRS) represents one of the most prevalent chronic inflammatory diseases worldwide, with significant public health implications. It affects approximately 5–15% of the adult population globally, with variations influenced by geographic, environmental, and genetic factors. CRS is characterized clinically by inflammation of the mucosa of the nasal cavity and paranasal sinuses lasting at least 12 consecutive weeks, despite medical therapy. Patients often suffer from symptoms such as nasal congestion, nasal discharge, facial pain or pressure, and impaired olfaction.

CRS is subclassified into two major phenotypes based on endoscopic and histopathological findings: CRS with nasal polyps (CRSwNP) and CRS without nasal polyps

(CRSsNP). These subtypes demonstrate distinct immunopathological pathways, clinical behaviors, and treatment responses. CRSwNP is typically associated with a type 2 immune response, eosinophilic inflammation, and a high rate of comorbidities such as asthma and aspirin-exacerbated respiratory disease (AERD). In contrast, CRSsNP is predominantly characterized by neutrophilic inflammation and a Th1 immune response, with less frequent nasal polyp formation.

The burden of CRS extends beyond physical discomfort. It impacts patients' quality of life by disrupting sleep, reducing productivity, and contributing to psychological distress, including depression and anxiety. Moreover, CRS poses a considerable economic burden on healthcare systems due to frequent physician visits, long-term medication use, and surgical interventions.

Despite advances in understanding the pathophysiology of CRS, management remains challenging. Medical therapies, including corticosteroids and antibiotics, aim to reduce mucosal inflammation and infection, but are often insufficient in refractory cases. Functional endoscopic sinus surgery (FESS) has revolutionized surgical management by allowing minimally invasive restoration of sinus ventilation and drainage.

This study aims to evaluate the clinical features, diagnostic tools, and outcomes of both medical and surgical treatments in adult patients with CRS treated at the Department of Otorhinolaryngology No. 2, Samarkand State Medical University. Through retrospective analysis, we seek to contribute to optimizing individualized treatment strategies and improving patient care.

Pathophysiology

The pathogenesis of CRS is complex and multifactorial, involving intricate interactions among host immune responses, environmental exposures, microbial agents, and genetic predispositions. The chronic inflammatory milieu leads to persistent mucosal swelling, impaired mucociliary clearance, and structural remodeling of the sinonasal mucosa.

Immune Mechanisms

In CRSwNP, the predominant immune profile is characterized by type 2 inflammation involving eosinophils, mast cells, basophils, and a cytokine milieu rich in interleukins IL-4, IL-5, and IL-13. These cytokines promote eosinophil recruitment, activation, and survival within the mucosa, contributing to tissue edema and polyp formation. Eosinophilic inflammation also induces tissue remodeling through the release of enzymes such as matrix metalloproteinases (MMPs).

Conversely, CRSsNP is typically marked by a Th1-mediated immune response with neutrophilic predominance and elevated interferon-gamma (IFN-γ) and tumor necrosis factor-alpha (TNF-α). This leads to fibrosis and mucosal thickening rather than polyp formation.

Microbial Factors

Bacterial colonization and biofilms play crucial roles in perpetuating CRS inflammation.

Biofilms protect bacteria from host immune responses and antibiotic penetration, leading to persistent infection and chronic inflammation. Common pathogens include Staphylococcus aureus, Haemophilus influenzae, and Pseudomonas aeruginosa.

Staphylococcus aureus superantigens have been implicated in exacerbating inflammation, especially in CRSwNP.

Fungal elements have been debated as contributors, but their role remains controversial and appears less significant than bacterial factors.

Treatment Modalities

Medical Therapy

Medical management is the first-line approach and includes:

Topical Corticosteroids: Nasal sprays or irrigations reduce mucosal inflammation and polyp size with minimal systemic effects.

Systemic Corticosteroids: Short courses are reserved for severe inflammation or exacerbations but carry risks of systemic side effects.

Antibiotics: Indicated for bacterial infections or acute exacerbations; however, their role in chronic management remains limited.

Nasal Saline Irrigation: Helps remove mucus, allergens, and debris, improving mucociliary clearance.

Adjunctive Therapies: Leukotriene receptor antagonists, antihistamines, and immunotherapy may be beneficial in select patients with allergic comorbidities.

Surgical Therapy: Functional Endoscopic Sinus Surgery (FESS)

Indicated for patients refractory to medical treatment or with anatomical obstruction.

FESS involves endoscopic removal of polyps and diseased mucosa and widening of sinus ostia to restore ventilation and drainage while preserving normal tissue.

Postoperative Care

Post-surgical management includes nasal corticosteroids, saline irrigation, and regular follow-up to monitor healing and prevent recurrence.

Materials and Methods

This retrospective study analyzed 150 adult patients diagnosed with CRS at the Department of Otorhinolaryngology No. 2, Samarkand State Medical University, between January 2022 and December 2024. Inclusion criteria were adults aged 18 and above with CRS diagnosed based on EPOS 2020 guidelines, confirmed by nasal endoscopy and CT imaging.

Data collected included demographics, clinical features, endoscopic and radiologic findings, treatment modalities, and follow-up outcomes over six months.

Patients initially received standardized medical therapy. Those with persistent symptoms or anatomical obstructions underwent FESS. Outcomes were assessed using symptom scores, endoscopic findings, and patient satisfaction surveys.

Results

Of the 150 patients, 90 (60%) had CRSsNP and 60 (40%) had CRSwNP. The mean age was 42.5 years, with a slight male predominance (56%). Nasal congestion was the most common symptom (92%), followed by facial pain (78%), and olfactory dysfunction (50%).

Medical therapy resulted in symptom improvement in 54 (60%) CRSsNP patients, evidenced by reduced nasal obstruction and discharge. In contrast, only 18 (30%) CRSwNP patients responded to medical treatment alone.

FESS was performed on 51 patients: 36 CRSwNP and 15 CRSsNP cases unresponsive to medical therapy. Postoperative evaluation showed significant symptom relief in 85% of cases, improved endoscopic appearance, and enhanced quality of life.

No major intraoperative or postoperative complications occurred. Minor adverse events included transient nasal bleeding and crusting.

Discussion

This study corroborates existing literature emphasizing the heterogeneity of CRS and the need for tailored treatment. The differential immune profiles between CRSwNP and CRSsNP explain variations in clinical presentation and treatment response.

The higher success rate of medical therapy in CRSsNP aligns with its neutrophilic, less aggressive inflammatory nature. Conversely, the eosinophilic inflammation and polyp burden in CRSwNP often necessitate surgical intervention.

FESS demonstrated excellent outcomes, underscoring its role in refractory CRS management. Restoration of sinus ventilation facilitates mucosal healing and reduces bacterial colonization.

Postoperative topical corticosteroids are vital in maintaining surgical benefits and preventing recurrence. Emerging therapies, such as biologics targeting IL-5 and IgE, represent promising avenues for severe CRSwNP cases.

Conclusion: Chronic rhinosinusitis remains a challenging condition requiring comprehensive evaluation and individualized treatment. Medical management effectively controls inflammation in many CRSsNP cases, while CRSwNP often demands surgical intervention with FESS. Combined medical and surgical strategies optimize patient outcomes and quality of life. Continued research into CRS pathophysiology and novel therapeutics will enhance future care.

References

1. Taxsinovna N. M. et al. VESTIBULAR VASCULAR REACTIONS IN ASSESSMENT OF VESTIBULAR DYSFUNCTION IN PATIENTS WITH CRANIOCEREBRAL TRAUMA //INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024. – 2024. – T. 3. – №. 29. – C. 104-111.
2. Uskov A. et al. Modern methods of therapeutic fasting as a way to overcome the pharmacoresistance of mental pathology //Science and innovation. – 2023. – T. 2. – №. D12. – C. 179-185.
3. Abdukodirova S., . SPECIFIC CHARACTERISTICS AND TREATMENT OF ACUTE OBSTRUCTIVE BRONCHITIS IN CHILDREN OF EARLY AGE //Science and innovation. – 2023. – T. 2. – №. D11. – C. 5-8.
4. Tahirova J. et al. Insomnia problem causes of sleep disorder, help measures at home //Science and innovation. – 2022. – T. 1. – №. D8. – C. 521-525.
5. Sultanov S. et al. Long-term salbi effects of the covid-19 pandemic on the health of existing residents of alcohol addiction //Science and innovation. – 2023. – T. 2. – №. D11. – C. 430-438.
6. Madaminov M., . Breast cancer detection methods, symptoms, causes, treatment //Science and innovation. – 2022. – T. 1. – №. D8. – C. 530-535.
7. Khaitov A. A. et al. Optimization of one-stage sanitation of the nasopharynx and tympanic
8. cavity in case of recurrent exudative otitis media // Current scientific research in the modern
9. world. - 2018. - No. 1-8. - P. 81-84. (in Russ)

10. Jalalova D. et al. СОЧЕТАННАЯ СТОМАТОЛОГИЧЕСКАЯ И ГЛАЗНАЯ ПАТОЛОГИЯ //Science and innovation. – 2022. – Т. 1. – №. D8. – С. 91-100.
11. Tohirova J. D. Jalalova TYPES OF HEMORRHAGIC DISEASES //CHANGES IN NEWBOENS, THEIR EARLY DIAGNOSIS.-2022.
12. Tahirova J. et al. Neurose causes and mechanisms of development, symptoms, treatment, prevention //Science and innovation. – 2022. – Т. 1. – №. D8. – С. 515-520.
13. Kiyomov I., . IMPROVING SURGICAL TREATMENT METHODS FOR PATIENTS WITH NASAL PATHOLOGY //Science and innovation. – 2023. – Т. 2. – №. D11. – С. 226-231.
14. Sarkisova V. et al. CYTOKINE PROFILE IN PATIENTS WITH GRANULOMATOSIS WITH POLYANGIITIS (WEGENER'S) //Science and innovation. – 2023. – Т. 2. – №. D11. – С. 336-343.
15. Sarkisova V., Lapasova Z., O. Rakhmanov INFLAMMATORY DISEASES OF THE PELVIC WOMEN ORGANS. – 2023.
16. Jalalova D., Raxmonov X., . РОЛЬ С–РЕАКТИВНОГО БЕЛКА В ПАТОГЕНЕЗЕ СОСУДИСТЫХ ЗАБОЛЕВАНИЙ ОРГАНА ЗРЕНИЯ У БОЛЬНЫХ АРТЕРИАЛЬНОЙ ГИПЕРТЕНЗИЕЙ //Science and innovation. – 2022. – Т. 1. – №. D8. – С. 114-121.
17. Malakhov A. et al. Modern views on the treatment and rehabilitation of patients with dementia //Science and innovation. – 2023. – Т. 2. – №. D12. – С. 322-329.
18. Jalalova D., Raxmonov X., . ЗНАЧЕНИЕ ДИСФУНКЦИИ ЭНДОТЕЛИЯ В РАЗВИТИЕ РЕТИНОПАТИИ У БОЛЬНЫХ АГ И ПУТИ ЕГО КОРРЕКЦИИ //Science and innovation. – 2022. – Т. 1. – №. D8. – С. 101-113.
19. Madaminov M., .Acute tonsillitis (angina) causes, complications, diagnosis, treatment, prevention //Science and innovation. – 2022. – Т. 1. – №. D8. – С. 771-779.
20. F. The problem of insomnia causes of sleep disorder, remedies at home //Science and innovation. – 2023. – Т. 2. – №. D1. – С. 79-84.
21. Sattarova S., FEATURES OF ELECTROPHYSIOLOGICAL METHODS FOR GUILLAIN–BARRÉ SYNDROME //Science and innovation. – 2023. – Т. 2. – №. D10. – С. 199-204.
22. F. Hymoritis symptoms, treatment, methods of folk medicine, prevention //Science and innovation. – 2023. – Т. 2. – №. D1. – С. 72-78.

23. Zhalalova D. et al. INFORMATION POINT OF PERIPHERAL BLOOD INDEXES IN THE DIAGNOSIS OF THE ETIOLOGY OF OPTIC NERVE DAMAGE //Science and innovation. – 2023. – T. 2. – №. D11. – C. 124-130.
24. Takhsinovna N. M., Musinovna R. K. CHARACTERISTICS OF COMPLAINTS FROM WORKERS IN NOISE PROFESSIONS, HAVING HEARING IMPAIRMENTS //Health Horizon: Congress on Public Health and Biomedical Sciences. – 2025. – T. 1. – №. 1. – C. 28-30.
25. Rotanov, A., . (2023). Elderly epilepsy: neurophysiological aspects of non-psychotic mental disorders. Science and innovation, 2(D12), 192-197.
26. Taxsinovna N. M. et al. VESTIBULAR VASCULAR REACTIONS IN ASSESSMENT OF VESTIBULAR DYSFUNCTION IN PATIENTS WITH CRANIOCEREBRAL TRAUMA //INNOVATIVE ACHIEVEMENTS IN SCIENCE 2024. – 2024. – T. 3. – №. 29. – C. 104-111.