OPTIMIZATION OF COMPREHENSIVE DIAGNOSIS AND TREATMENT OF CHRONIC ALLERGIC RHINOSINUSITIS

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The aim of this study was to optimize the diagnostic algorithm and therapeutic strategy for chronic allergic rhinosinusitis (CARS) by integrating clinical, endoscopic, radiological, and immuno-inflammatory biomarkers to improve disease stratification and treatment outcomes.

ABSTRACT

A total of 98 patients aged 18–65 years with clinically confirmed CARS (duration ≥12 weeks) were examined at the Bukhara Regional Multidisciplinary Medical Center. Diagnostic evaluation included: nasal endoscopy; CT scanning of paranasal sinuses; total and allergen-specific IgE; blood and nasal eosinophil count; inflammatory cytokines (IL-4, IL-5, IL-13); and assessment of nasal mucosal barrier function. Symptom severity was quantified using the SNOT-22 scale and visual analogue scores (VAS). All patients received standardized baseline therapy; among them, 36 patients additionally underwent biologic treatment (omalizumab or mepolizumab). Statistical analysis included Student's t-test and correlation analysis (Pearson).

Objective: The aim of this study was to optimize the diagnostic algorithm and therapeutic strategy for chronic allergic rhinosinusitis (CARS) by integrating clinical, endoscopic, radiological, and immuno-inflammatory biomarkers to improve disease stratification and treatment outcomes.

Materials and Methods. A total of 98 patients aged 18–65 years with clinically confirmed CARS (duration ≥12 weeks) were examined at the Bukhara Regional Multidisciplinary Medical Center. Diagnostic evaluation included: nasal endoscopy; CT scanning of paranasal sinuses; total and allergen-specific IgE; blood and nasal eosinophil count; inflammatory cytokines (IL-4, IL-5, IL-13); and assessment of nasal mucosal barrier function. Symptom severity was quantified using the SNOT-22 scale and visual analogue scores (VAS). All patients received standardized baseline therapy; among them, 36 patients additionally underwent biologic treatment (omalizumab or mepolizumab). Statistical analysis included Student's t-test and correlation analysis (Pearson).

Results. Endoscopic examination identified mucosal edema and persistent eosinophilic inflammation in 71.4% of cases, confirmed by elevated nasal eosinophils (18.7±6.3%). CT scanning revealed moderate-to-severe sinus opacification in 62.2%

of patients. Serum IgE levels were significantly higher in patients with multi-sensitization (356±92 IU/mL; $p<0.001$). Cytokine analysis demonstrated increased IL-5 and IL-13 ($p<0.01$), which directly correlated with disease severity on SNOT-22 ($r=+0.48$ and $r=+0.52$ respectively). Patients receiving biologic therapy showed significant improvement in nasal airflow ($p<0.01$), reduction of eosinophil counts ($p<0.001$), and a decrease in SNOT-22 score by 43%. Surgical intervention (functional endoscopic sinus surgery) was required in 18 patients with refractory disease and resulted in marked symptom relief and reduction of relapse frequency during follow-up.

Conclusion. Chronic allergic rhinosinusitis is characterized by persistent eosinophilic inflammation, elevated IgE, mucosal barrier dysfunction, and cytokine imbalance. Integration of endoscopic, radiological, and immunological markers enhances diagnostic accuracy and allows identification of patients who may benefit from tiered therapy, including biologics. Optimized, individualized treatment significantly improves symptom control, reduces inflammation, and lowers the rate of disease recurrence.