Predictive value of comorbid asthma and blood eosinophil count for the efficacy of dupilumab – a one-year follow-up under real world conditions

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Introduction: Chronic rhinosinusitis (CRS) is an inflammatory disease of the upper respiratory tract, that can be divided into type 2 (T2) and non–type 2 endotype. Type 2 CRS is characterized by eosinophilic inflammation and elevated levels of IL-4, IL-5, and IL-13, and is often associated with asthma, allergy, and chronic rhinosinusitis with nasal polyposis (CRSwNP) (Fokkens et al., 2020). These patients often have a more severe disease course, frequent recurrences and a poor response to conventional therapy, whereas the biologics of targeting type 2 inflammation have shown good efficacy (Bachert et al., 2019; Klimek et al., 2022). Dupilumab, an IL-4/IL-13 receptor antagonist, was approved for the treatment of CRSwNP refractory to standard therapy. The aim of the study was to investigate the therapeutic effect of dupilumab over a 12-month treatment period under real-world conditions and to examine whether comorbid asthma and the level of peripheral blood eosinophil count have an impact on the response to therapy. Methods: The study included 249 patients with severe CRSwNP, 82.3% of whom had asthma. The patients were divided into four groups based on their asthma status and blood eosinophil count: (1) no asthma and <300 eosinophils/µL; (2) no asthma and ≥300 eosinophils/µL; (3) asthma and <300 eosinophils/µL; (4) asthma and ≥300 eosinophils/µL. All the patients were evaluated at baseline, six months, and 12 months. The outcome measures included SNOT-22, VAS scores, Bachert's nasal polyp score, a smell test and peripheral blood eosinophil count. Statistical analysis was performed using nonparametric tests. Results: All clinical parameters showed improvement within six months ($p < 0.05$), and the effect was maintained up to 12 months. SNOT-22 and VAS scores decreased. The Sniffing sticks test confirmed an improved sense of smell and Bachert's scale indicated a reduction in polyp size. Comorbid asthma and eosinophil count had no significant impact on the therapeutic effect. The Kruskal Wallis test at 12 months showed no statistically significant differences between the groups. Conclusion: Dupilumab over 12 months improves the symptoms, endoscopic findings, and olfactory function in patients with CRSwNP. The therapeutic effect is consistent regardless of the presence of asthma or eosinophil levels, confirming its efficacy in treating patients with type 2 CRS.

Key words: chronic rhinosinusitis with nasal polyposis, dupilumab, eosinophils, asthma