

The interaction of IFN- γ , IL-4 and IL-5 with the inflammation severity, predisposing factors and phenotype in chronic rhinosinusitis

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Introduction: Chronic rhinosinusitis (CRS) is a complex clinical syndrome, where the interaction of different predisposing factors has an impact on symptoms and pattern of inflammation.

Aim: The aim of the study was to show the regulation of different cytokines (IFN- γ , IL-4 and IL-5) related to CRS phenotypes and comorbidities.

Methods: The study included 50 patients with CRS according to EPOS criteria. Sinus and polyp samples were collected at sinus surgery: 29 from non-allergic CRS without nasal polyps (CRSsNP), 9 from allergic non-asthmatic CRSsNP, 17 from allergic asthma, 11 from non-allergic asthma, 5 from aspirin intolerant CRS with nasal polyps (CRSwNP). The tissue homogenates were prepared immediately on ice and incubated with protease inhibitor. Assays (R&D System, Quantikine ELISA, UK) for interleukins IL-4, IL-5 and for interferon gamma (IFN- γ) employed the quantitative sandwich enzyme immunoassay technique, CT scans were scored with the Lund-Mackay scoring system. The Kruskal-Valis test was performed to compare values of tissue homogenate concentrations of cytokines between groups.

Results: The study included 50 CRS (30 males) patients mean age of 43.2 years; 32 with CRSsNP and 18 with CRSwNP. IL-4 was not significantly different between the groups. IL-5 was significantly higher in allergic asthma than in both CRSsNP and in non-allergic asthma than in CRSsNP with allergic sensitization. Unexpectedly, IFN- γ was significantly higher in CRSsNP with allergic sensitization than in other groups. IL-5 was the only cytokine that correlated with the CT score. IL-4 correlated significantly with both IL-5 and IFN- γ .

Conclusion: The data confirmed significantly higher IL-5 concentrations in asthmatic patients which are mainly CRSwNP, and in CRSwNP versus CRSsNP in general. IFN- γ concentrations in CRSsNP with allergic sensitization are significantly higher than in any other subgroup. Up-regulation of IL-4 in ASA intolerant subgroup suggested greater involvement of IL-4 in the pathogenesis of CRS in ASA intolerant patients than in other subgroups.

Keywords: chronic rhinosinusitis, interleukin 4, interleukin 5, interferon gamma