Nasal levels of soluble IL-33R ST2 and IL-16 in allergic rhinitis: inverse correlation trends with disease severity.

Abstract:
Serum levels of IL-16, IL-33 and the decoy receptor of IL-33, soluble ST2, are elevated in allergic rhinitis. Recent studies show that IL-16, soluble ST2 or anti-IL-33 reduce type 2 cytokines (such as IL-5) and eosinophilia in murine models of allergic asthma or allergic rhinitis respectively. In this study, we studied the release of IL-5, IL-16, IL-33 and soluble ST2 in allergic rhinitis patients after nasal allergen challenge and natural pollen exposure. The nasal lavages of 15 allergic and 14 non-allergic volunteers were collected during the pollen allergy season. In addition, six allergic volunteers underwent unilateral nasal allergen and control challenge out of season and nasal secretions and sera were collected. IL-5, IL-16, IL-33 and soluble ST2 in nasal secretions and sera were measured by electrochemiluminescent assay or ELISA, respectively. Nasal IL-5, IL-16 and soluble ST2 levels were significantly increased in seasonally pollen exposed allergic volunteers compared to control subjects (P< 0.001, P = 0.018 and P = 0.002 respectively), whereas IL-33 remained undetectable. Nasal IL-16 showed a weak inverse correlation trend with nasal symptoms (r = -0.48, P = 0.07). Nasal soluble ST2 concentrations were inversely correlated with nasal symptoms (r = -0.61, P = 0.02) and positively correlated with IL-16 (r = 0.56, P = 0.03). Significant
increases of nasal IL-5, IL-16 and ST2 but not IL-33 were observed after nasal allergen challenge. At 24 h after allergen challenge, local ST2 and IL-5 concentrations showed an inverse correlation trend (r = -0.83, P = 0.04). Serum levels of IL-5, IL-16 and soluble ST2 rose in at least five of six volunteers tested at 5 or 24 h post-challenge. The observed upregulation of soluble ST2 and IL-16 after nasal allergen challenge and during peak pollination season suggests potential regulatory roles of these cytokines in the inflammatory reaction in allergic rhinitis.