The role of Staphylococcal exotoxin B on the differentiation of regulatory T cells in patients with CRSwNP

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ABSTRACT

The pathogenesis of nasal polyps has not been fully understood. Recent studies indicate that there is a subset of CD4+CD25+FoxP3+ T cells (Tregs) that express RORC+ or IL-17, and these cells might be new proinflammatory cells because of the expression of IL-17 with their suppressive function.

Objective: The aims of this study were to localize the SEB and Th17-like Tregs (or RORC+Tregs) in the tissue of nasal polyp tissue and to investigate the role of SEB on the differentiation of Th17-like Tregs in vitro.

Methods: Double Immunofluorescent Staining for SEB, FOXP3, and IL-17 were conducted on the tissues from 20 control subjects and 40 patients with nasal polyps (20 patients with eosinophilic poly and 20 patients with non-eosinophilic poly). PBMCs were separated from each subject, stimulated with SEB (10μg/ml) for 24 hours and 48 hours, and the percentages of the various T cell subtypes and cytokines profiles from the supernatant were measured by using flow cytometry.

Results: The cells that express both SEB and FOXP3 or IL-17 and FOXP3 were significantly higher in both the nasal polyps, especially eosinophilic poly, and in control mucosa. RORC+Tregs were significantly increased in patients with eosinophilic poly, while the suppressive functions of these cells were decreased. This may be due to an increasing Tregs subset occurring at the same time (Fig. 3A and 3B). Furthermore, after 24 hours of stimulation with SEB, the proportion of CD4+CD25+FoxP3+RORC+T cells in CRSwNP patients compared to the control subjects (Fig. 5C), since more significant increase of Tregs was documented in CRSwNP patients compared to control subjects (Fig. 3C).

In conclusion, our results indicated that SEB may be involved in the differentiation of Tregs to RORC+ in vitro.

CONCLUSIONS

Nasal polyps has been considered more as a result of local immune response rather than a systemic immune reaction. However, responses of T cells to SEB stimulation in PBMCs were different among the groups in our study. These results indicated that different systemic immune responses to SEB among the groups could be one of the contributing factors in the pathogenesis of nasal polyps.

In conclusion, our results indicated that SEB may be involved in the differentiation of Tregs to RORC+Tregs that have decreased suppressive function. The increased production of inflammatory cytokines and these cells may be involved in the pathogenesis of eosinophilic nasal polyps.