Modulation of Substance P in nasal secretions by short-term immunotherapy with molecular standardized grass and rye allergens

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Introduction
Pathophysiologic mechanisms underlying the inflammatory processes of allergic rhinitis have been focussed in many investigations. However, evidence was found that mast cells and their specific mediators, e.g. Tryptase and Histamine, play a central role in the inflammatory cascade. Recently, neuronal mechanisms and their specific neuropeptides like Substance P (SP) revealed to co-regulate the process and could also be evaluated in the nasal secretion¹.

Many studies have investigated the modulation of the cellular inflammatory pathways under the specific immunotherapy (SIT).

Objective
The effect of short-term immunotherapy with 7 pre-seasonal injections of molecular standardized allergens from grass and rye pollen on SP in nasal secretions has been compared with symptomatic drug treatment in an open, randomized study with 48 patients over a 6-months period.

Methods
SP-levels in nasal secretions were quantified before season, in season, and after season. Furthermore, SP levels after nasal challenge test before season and after season were measured.

Results
Substance P levels increased significantly during season in both groups. The seasonal levels for Substance P in the immunotherapy group were significantly lower than in the drug-treated group (Fig. 1).

The post-seasonal levels decline in both groups but remain significantly higher than in pre-seasonal measurements.

After nasal challenge with grass-pollen a significant higher post-seasonal level of SP was found compared to pre-seasonal measurements in both groups. However, the SP-levels of the IT-group revealed significant lower levels compared to the control group (Fig. 2).

Aim
As a consequence of the knowledge of neuronal mechanisms in the nasal-inflammatory cascade it might be hypothesized that the synthesis of neuropeptides like SP should also be modulated by SIT.

The current study was aimed to measure SP in the nasal secretion of SIT-treated patients compared to a drug treated control group during pollen-season and in the post-seasonal period.

Secondly, the study focussed on the secretion of nasal SP after provocation in both groups.

Conclusion
Pre-seasonal short-term immunotherapy is able to reduce neuropeptides like SP in the nasal secretions more effectively than drug treatment in patients with allergic rhinitis.

Reference: