Nasal biomarker profiles to distinguish between high and low symptomatic, non allergic and allergic subjects in a natural pollen exposure study [Abstract]

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Angaben zur Veröffentlichung / Publication details:

Gökkaya, M., Athanasios Damialis, Thomas Nussbaumer, I. Beck, N. Bounas Pyrros, S. Bezold, M. Amisi, et al. 2020. "Nasal biomarker profiles to distinguish between high and low symptomatic, non allergic and allergic subjects in a natural pollen exposure study [Abstract]." *Allergy* 75 (S109): 604. https://doi.org/10.1111/all.14509.

1606 | Nasal biomarker-profiles to distinguish between high- and low-symptomatic, non-allergic and allergic subjects in a natural pollen exposure study

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Background: Pollen exposure induces local and systemic allergic immune responses in sensitized individuals, but also non-sensitized individuals are exposed to pollen. The kinetics of symptom expression under natural pollen exposure has never been systematically studied, especially including non-allergic subjects.

We monitored the humoral immune response under natural pollen exposure to potentially uncover nasal biomarkers for in-season symptom severity and to identify protective factors.

Method: We compared humoral immune response kinetics in a panel study on seasonal allergic rhinitis (SAR) and non-allergic (NA) subjects, and tested for cross-sectional and inter-seasonal differences in levels of serum and nasal, total and Bet v 1-specific immunoglobulin (Ig) isotypes, Ig free light chains, cytokines and chemokines. Non-supervised principal component analysis (PCA) was performed for all nasal immune variables and single immune variables were correlated with in-season symptom severity by Spearman test.

Results: Symptoms followed airborne pollen concentrations in SAR subjects with a time lag between 0 and 13 days, depending on the pollen type. Out of 7 NA subjects, 4 also exhibited in-season symptoms whereas 3 did not. Cumulative symptoms in NA were lower than in SAR but followed the pollen exposure with similar kinetics. Nasal Eotaxin-2, MDC and MCP-1 levels were higher in SAR, IL-8 higher in NA subjects. PCA and Spearman correlations identified nasal IL-8, IL-33, and Bet v 1-specific IgG_4 ($sIgG_4$) and sIgE antibodies as predictive for seasonal symptom severity.

Conclusion: Nasal pollen-specific IgA and IgG isotypes are potentially protective within the humoral compartment. Nasal IL-8, IL-33, $sIgG_4$ and sIgE could be predictive biomarkers for pollen-specific symptom expression, irrespective of atopy.