



### Association of IgE profiles to micro-arrayed house dust mite allergens with allergic symptoms measured in a house dust mite challenge chamber

Azahara Rodríguez-Domínguez,<sup>1</sup> Yvonne Resch,<sup>1</sup> Petra Zieglmayer,<sup>2</sup> Rudolf Valenta,<sup>1</sup> Susanne Vrtala<sup>1</sup>

<sup>1</sup>Medical University of Vienna, Center of Pathophysiology, Division of Immunopathology, Infectiology and Immunology, Vienna, Austria

<sup>2</sup>Vienna Challenge Chamber, Allergy Center Vienna West, Vienna, Austria

Correspondence: Azahara Rodríguez-Domínguez.

azahara.rodriguezdominguez@meduniwien.ac.at

**Background:** IgE-associated allergic sensitization to house dust mite (HDM) allergens is associated with a variety of allergic symptoms such as rhinitis, conjunctivitis, dermatitis and asthma. Allergen exposure chambers allow the precise assessment of clinical symptoms specifically induced with HDMs.

**Objective:** To investigate if an association between serologic IgE and HDM-induced symptoms such as asthma, rhinitis and conjunctivitis can be established.

**Methods:** The clinical symptoms of 91 HDM allergic patients were assessed in the Vienna Challenge Chamber during a controlled 6-hour exposure to HDM allergens. The symptoms assessed were total nasal symptom score, total ocular symptom score and asthma symptom score. Sera from the 91 patients were tested for IgE reactivity to 13 *Dermatophagoides pteronyssinus* allergens using allergen microarray technology (ImmunoCAP ISAC chip technology) and allergen-specific IgE levels to *Dermatophagoides pteronyssinus* (Der p) allergen extract were quantified by ImmunoCAP measurements.

**Results:** Patients with high Der p-specific IgE levels measured by ImmunoCAP (> 10 kU/L) had higher IgE-levels to all important HDM allergens than patients with low IgE levels (< 10kU/L), but no correlation was found between the Der p-specific IgE levels and the symptom scores (asthma symptom score, total nasal symptom score and total ocular symptom score). Patients with high total nasal symptom score (> 6, mean value of four hours) also had higher asthma symptom score and total ocular symptom score, as well as higher IgE-levels to micro-arrayed Der p: 2, 5, 7, 21 and 23 compared to patients with low total nasal symptom score (< 6). Additionally, higher IgE-levels to micro-arrayed Der p 5, 7 and

21 were found in patients with high ASS (> 4) and in patients with high Total Ocular Symptom Score (> 2) compared to those with low symptom scores.

**Conclusions:** Our study indicates that IgE-reactivity profiles to micro-arrayed HDM allergens but not allergen-specific IgE levels to HDM extracts are associated with allergic symptoms to HDM exposure.

**Keywords:** House dust mite; Allergen exposure chamber