ORIGINAL ARTICLE

Skin prick tests with *Der p* 1, *Der p* 2 and *Der p* 23: are they useful?

Pedro Samuel Figueiredo[1], Ana Filipa Vassalo[1], Joana Cosme[1,2], Joana Caiado[1,2], Anabela Lopes[1,2], Estrella Alonso[1], Ana Mendes[1], Diana Feliciano Santos[3,4], Elisa Pedro[1], Manuel Branco Ferreira[1,2], Natalia Gómez[5], Alan Hernandéz Llamazares[5], Javier Alcover Díaz[5], David Rodriguez Gil[5], Amélia Spínola-Santos[1,2]

[1]Department Immunoallergology, Santa Maria Local Health Unit, Santa Maria Hospital EPE, Lisbon, Portugal

[2]Immunoallergology University Clinic, Medical Faculty, Lisbon University, Lisbon, Portugal

[3]GIMM - Gulbenkian Institute for Molecular Medicine, Lisbon, Portugal

[4]Medical Faculty, Lisbon University, Lisbon, Portugal

[5]Laboratorios DIATER, Leganés, Madrid, Spain

Summary

Background. Sensitization to *Dermatophagoides pteronyssinus* molecular allergens (MA) *Der p*1, *Der p*2 and *Der p*23 was previously only detectable via *in vitro* specific IgE (sIgE). As these allergens are now available for skin prick testing (SPT), we aimed to compare the frequency and concordance of MA sensitization *in vitro* and *in vivo*. **Methods.** We included patients with respiratory allergies using SPT with a panel of aeroallergens including n*Der p*1, r*Der p*2 and r*Der p*23 (Diater®). Results were compared with sIgE levels measured by ALEX2®. **Results.** Twenty-two patients were included (68% females, mean age 31.7 ± 11.3 years), all sensitized to *Dermatophagoides pteronyssinus* whole extract. On SPT, sensitization rates were 100% for n*Der p*23, 91% for n*Der p*2 and 59% for n*Der p*1. By sIgE, rates were 86% for *Der p*23, 86% for *Der p*2 and 77% for *Der p*1. Median sIgE were 13.2 k_{UA}/L to *Der p*2, 6.8 k_{UA}/L to *Der p*1 and 4.4 k_{UA}/L to *Der p*23. Significant correlations between SPT wheal diameter and sIgE levels were found for *Der p*1 (r = 0.56, p-value 0.007) and *Der p*2 (r = 0.51, P-value 0.015), but not for *Der p*23. Concordance between methods was 95% to *Der p*2, 86% to *Der p*23 and 77% to *Der p*1. **Conclusions.** SPT with n*Der p*1, r*Der p*2 and r*Der p*23 might be a reliable and practical method for assessing molecular sensitization profiles.

KEY WORDS

Dermatophagoides pteronyssinus; Der p 1, *Der p* 2, *Der p* 23; Molecular allergens; skin prick tests; specific IgE.

IMPACT STATEMENT

Skin prick testing with major molecular components of *Dermatophagoides pteronyssinus* represents a rapid, cost-effective and reliable approach for precision allergy diagnosis in clinical practice, comparable to standard laboratory-based sIgE determination.

Manuscript accepted for publication

Introduction

House dust mites (HDM), particularly *Dermatophagoides pteronyssinus* (*Der p*), are the main allergens associated with respiratory allergies in Portugal. (1) HDM sensitization is typically predicted through a comprehensive clinical history and subsequently confirmed either in vivo via skin prick tests (SPT) utilizing whole extracts, or in vitro by quantifying specific IgE (sIgE) to total extract or their molecular allergens (MA) components - most notably n*Der p* 1, r*Der p* 2 and r*Der p* 23. (2) While sensitization to minor allergens can be identified through single or multiplex laboratory assays, these methods are less frequently implemented in routine clinical practice due to logistical constraints.

Recently, molecular diagnosis has been adapted for aqueous extracts, facilitating MA identification directly via SPT. This diagnostic modality offers the potential for high diagnostic accuracy with reduced time and resource expenditure. (3) However, there remains a paucity of data regarding the clinical reliability and performance of using *D. pteronyssinus* molecular allergens for SPT in real-world settings.

The objective of this study is to characterize the results of SPT using n*Der p* 1, n*Der p* 2 and n*Der p 23* and to evaluate their concordance with sIgE levels for the same molecular allergens as measured by multiplex assay (ALEX2® Allergy Explorer Test, MacroArrayDx (Wien, Austria)). Additionally, we aim to determine the frequency of sensitization to other D. pteronyssinus molecular allergens (r*Der p* 5, r*Der p* 7, r*Der p 10, rDer p* 11, r*Der p* 20 and r*Der p 21*) utilizing the ALEX2® platform.

Material and methods

Study design and inclusion criteria

This study enrolled patients aged 12 years and older *p*resenting with allergic rhinitis, with or without concomitant asthma. Eligibility criteria included a positive SPT for *Dermatophagoides pteronyssinus* whole extract and provision of informed consent. In addition to a standard aeroallergen panel, SPTs were conducted using molecular *Der p* extracts (n*Der p* 1, r*Der p* 2 and r*Der p 23)*. Furthermore, the ALEX2® macroarray was employed to facilitate a comparative analysis between SPT reactivity and laboratory-determined sIgE profiles.

SPT were performed utilizing *Dermatophagoides pteronyssinus* whole extract [5 HEP] and purified major allergen extracts n*Der p* 1 [15 µg/mL], n*Der p* 2 [16 µg/mL] and n*Der p 23* [3 µg/mL] (all from Laboratorios Diater®). A positive result was defined as a mean wheal diameter ≥ 3mm greater than that of negative control. For sIgE quantification, fresh blood samples were centrifuged and the serum was subsequently frozen. Serum analysis was conducted using the ALEX2® Allergy Explorer Test, MacroArrayDx (Wien, Austria), at Laboratorios Diater (Leganés, Madrid). Results were considered positive at concentrations ≥0.3 k_{UA}/L, in accordance with the manufacturer's instructions.

Statistical analysis

Statistical analysis was performed using IBM® SPSS® software, version 26.0 (IBM Corp., Armonk, NY, USA). Categorical variables are presented as absolute frequencies and percentages, while continuous variables are expressed as medians and interquartile ranges (IQR). Comparative analyses between groups were conducted using Spearman's rho correlation coefficient, where appropriate. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were determined for n*Der p* 1, n*Der p* 2 and n*Der p 23*. Additionally, Cohen's kappa and

Manuscript accepted for publication

the prevalence-adjusted bias-adjusted kappa (PABAK) coefficients were calculated using Python programming (Python Software Foundation).

Ethical approval

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and complied with all relevant national legislation. Ethical approval was obtained from the Ethics Committee of the Academic Medical Centre of Lisbon (CAML), Portugal (Reference No. 101/24). Written informed consent was obtained from all participants; for individuals under 18 years of age, consent was also provided by their parents or legal guardians. Pregnant and breastfeeding women were excluded from the study.

Results

Twenty-two patients with allergic rhinitis were included 41% (n = 9) of whom also had asthma (Table 1). The majority were female (n = 15; 68%), with a mean age of 31.7±11.3 years (range 13:72). All patients (100%) were sensitized to the *D. pteronyssinus* whole extract on SPT, and 50% demonstrated positivity to all three MA. In our study population, the prevalence of sensitization by SPT was 100%, 91%, and 59% for n*Der p* 23, n*Der p* 2 and n*Der p* 1, respectively. In vitro results showed sensitization rates of 86% for r*Der p* 23, 86% for r*Der p* 2, and 77% for n*Der p* 1. Median sIgE levels were 6.8 kU_A/L for n*Der p* 1, 13.2 kU_A/L for r*Der p* 2, and 4.4 kU_A/L for r*Der p* 23 (Table 1). Figure 1 illustrates the sensitization profiles identified by SPT (Fig. 1A) and *in vitro* (Fig. 1B). Contingency tables were used to assess the association between SPT and sIgE (Table 2). The diagnostic agreement (overlap) between both methods was 95% for r*Der p* 2, 86% for r*Der p* 23, and 77% for n*Der p* 1. A moderate correlation was found between SPT mean wheal diameter and sIgE levels for n*Der p* 1 ($r=0.56$, $p<0.007$) and r*Der p* 2 ($r=0.51$, $p<0.015$), whereas no significant correlation was observed for r*Der p* 23 ($r=0.34$, $p=0.119$).

Table 1 additionally presents the results for other *Dermatophagoides pteronyssinus* minor allergens obtained via ALEX2®. Among patients positive for major allergens, r*Der p* 5 (median 6.0 kU_A/L) and r*Der p* 21 (median 1.3 kU_A/L) showed positivity in 15 (68%) and 14 (64%) patients, respectively (Table 1). Sensitization rates were below 50% for the remaining allergens, specifically r*Der p* 7, r*Der p* 10, r*Der p* 11, and r*Der p* 20. The majority of the cohort (68%) was sensitized to between four and six *D. pteronyssinus* molecular components. Regarding diagnostic performance, n*Der p* 1 exhibited a sensitivity of 70.6%, specificity of 80%, a PPV of 92.3%, and a NPV of 44.4%, with a Cohen's kappa of 0.39 and a PABAK of 0.45. For r*Der p* 2, the analysis yielded a sensitivity of 95%, specificity of 100%, PPV of 100%, and NPV of 66.7%, with a Cohen's kappa of 0.78 and a PABAK of 0.91. r*Der p* 23 demonstrated a sensitivity of 100% and a PPV of 86.4%, with a PABAK of 0.73; however, specificity, NPV, and Cohen's kappa could not be reliably determined due to the absence of negative SPT results for this allergen.

Table 1 also presents a comparative analysis of sensitization to *D. pteronyssinus* MA according to respiratory allergy phenotypes (rhinitis only vs. rhinitis with concomitant asthma). No statistically significant differences were observed between the two groups; however, the prevalence of sensitization to r*Der p* 23 approached statistical significance, with a p-value of 0.053.

Discussion

Manuscript accepted for publication

Regarding the major allergens of *D. pteronyssinus* in our study group, n*Der p* 23 was the most frequent sensitizing component, followed by n*Der p* 2, in both *in vivo* and *in vitro* assessments. While n*Der p* 1 is widely reported as the immunodominant allergen globally, studies in the Iberian Peninsula, particularly in Portugal, have identified n*Der p* 2 as the most prevalent allergen *in vitro*. (4-7) Our findings confirm that n*Der p* 2 sensitization is more frequent than n*Der p* 1 in both testing modalities; however, they also demonstrate that n*Der p* 23 is at least as prevalent as n*Der p* 2 within this Portuguese cohort.

As demonstrated by Til-Pérez (3) and Di Spigna (8), molecular in vitro diagnostics enable a more comprehensive characterization of the patient's sensitization profile. In comparing *in vivo* and *in vitro* methodologies, we observed that patients sensitized to n*Der p* 2 or n*Der p* 23 were more frequently identified via SPT, whereas n*Der p* 1 sensitization was more likely to be missed by this method. Despite discrepancies in the molecular profiles identified by the two modalities - with SPT and sIgE yielding four and six distinct profiles, respectively - the most prevalent pattern included all three major allergens (n*Der p* 1, n*Der p* 2 and n*Der p 23).* This finding is consistent with previous experimental studies. (9-12)

We observed a significant correlation between SPT mean wheal diameter and sIgE levels for n*Der p* 1 ($r= 0.56$, $p<0.05$) and *Der p* 2 ($r=0.51$, $p<0.05$); however, this correlation was not sustained for r*Der p* 23. Despite the high diagnostic agreement between the two methods, wheal diameter and sIgE concentrations demonstrated only a moderate-to-weak correlation. As established in the World Allergy Organization position paper by Ansotegui et al., (13) this discrepancy is expected, as SPT and sIgE measure distinct biological phenomena. While SPT reflects the functional reactivity of mast cells and the immediate release of inflammatory mediators in vivo, sIgE concentrations represent the circulating humoral load, which does not necessarily dictate the magnitude of the effector cell response. (4,10,13) These findings suggest that while SPT utilizing D. pteronyssinus major allergens is a reliable and rapid method for identifying molecular sensitization, its results should be interpreted as complementary to, rather than interchangeable with, in vitro sIgE levels.

Regarding diagnostic performance, r*Der p* 2 exhibited the highest overall accuracy, demonstrating superior sensitivity, specificity, and predictive values (PPV and NPV). These findings were further supported by robust agreement metrics, including Cohen's kappa and the Prevalence-Adjusted Bias-Adjusted Kappa (PABAK). r*Der p* 23 also showed strong diagnostic performance. Conversely, n*Der p* 1 demonstrated comparatively lower diagnostic accuracy within this cohort. Collectively, these results suggest that skin prick testing with *D. pteronyssinus* molecular components is a clinically valuable tool, particularly when assessing sensitization to n*Der p* 2 and n*Der p* 23.

Literature regarding the clinical impact of different *D. pteronyssinus* major allergens remains heterogeneous; however, r*Der p* 23 has been increasingly linked to both the presence and severity of asthma. (10,12,14-16) In our cohort, we did not identify statistically significant differences in sensitization profiles between clinical phenotypes; nevertheless, sensitization to r*Der p* 23 approached statistical significance ($p=0.053$) in patients with concomitant asthma. This trend might align with recent evidence suggesting that r*Der p* 23 is not only a major sensitization marker but also a potential indicator of asthma development and persistence. (17) Furthermore, our findings support the observations of Eder et al., (16) who emphasized the clinical necessity of including *Der p* 23 in diagnostic panels to avoid underdiagnosing dust mite allergy, particularly in patients where it may be the primary or sole sensitizing component. The near-significant association observed in our cohort reinforces the importance of this allergen as a potential indicator of lower airway involvement.

Manuscript accepted for publication

Another relevant finding in our study was the prevalence of sensitization to r*Der p* 5 (68%) and r*Der p* 21 (64%). These results suggest that these components might behave as major allergens in certain populations, although this observation should be interpreted with caution due to our limited sample size. Currently, despite the recent and increasingly evidence of intermediate allergens in house dust mites allergy, there is no global consensus regarding the classification of r*Der p* 5 and r*Der p* 21 as major allergens, with prevalence rates varying significantly across different geographical regions. (2,9,10,15,17-19) Nevertheless, our findings carry clinical weight, particularly concerning allergen immunotherapy (AIT). Many commercial extracts may not contain sufficient or standardized concentrations of certain components, specifically r*Der p* 23, r*Der p* 5, or r*Der p* 21, potentially impacting the therapeutic efficacy in patients primarily sensitized to these allergens (20)

In conclusion, despite the limited sample size, our results suggest that skin prick testing with *D. pteronyssinus* major allergens is a reliable and accurate approach for molecular sensitization profiling in clinical practice. The diagnostic performance of n*Der p* 2 and n*Der p* 23, coupled with the near-significant association of the latter with the asthma phenotype, might reinforce the clinical relevance of including these components in the diagnostic work-up. As a rapid, cost-effective, and minimally invasive method, molecular-based *in vivo* testing holds significant potential for refining allergy diagnostics. However, further studies with larger, multi-center cohorts are warranted to validate these findings and to further explore the geographical variability of sensitization to group 5 and 21 allergens.

Acknowledgments

We would like to thank Laboratorios Diater for the n*Der p* 1 [15 µg/mL], n*Der p* 2 [16 µg/mL] and n*Der p 23* [3 µg/mL] aqueous extracts and for the *in vitro* quantification of sIgE.

Conflicts of interest

N. Gómez, A.H. Llamazares, J. Alcover Díaz, and D. Rodriguez Gil are employees of Diater (Laboratorio de Diagnóstico y Aplicaciones Terapéuticas S.A., Madrid, Spain). The remaining authors declare that they have no conflicts of interest related to this study.

Financial support

Molecular extracts and experimental analyses were provided by Diater (Laboratorio de Diagnóstico y Aplicaciones Terapéuticas S.A., Madrid, Spain).

Authors contributions

Conceptualization, Methodology: Amélia Spínola-Santos e Manuel Branco Ferreira

Investigation, Data Curation, Writing - Original Draft: Pedro Samuel Figueiredo

Laboratorial analysis: Diana F. Santos, Natalia Gómez, Alan Hernandéz Llamazares, Javier Alcover Diaz, David Rodríguez Gil

Formal Analysis: Filipa Vassalo

Writing - Review & Editing: Ana Filipa Vassalo, Joana Cosme, Joana Caiado, Anabela Lopes, Estrella Alonso, Ana Mendes, Elisa Pedro, Manuel Branco Ferreira, Amélia Spínola-Santos

Supervision: Manuel Branco Ferreira

Manuscript accepted for publication

References

1. Limão R, Spínola Santos A, Araújo L, Cosme J, Inácio F, Tomaz E, et al. Molecular profile of sensitization to Dermatophagoides pteronyssinus dust mite in Portugal. J Investig Allergol Clin Immunol. 2022;32(1):33-9. doi: 10.18176/jiaci.0533.
2. Hoffmann K, Hilger C, Santos A, De Las Vecillas L, Dramburg S, editors. Molecular Allergology User's Guide 2.0. Zurich: European Academy of Allergy and Clinical Immunology; 2022.
3. Til-Pérez G, Carnevale C, Sarría-Echegaray PL, Arancibia-Tagle D, Chugo-Gordillo S, Tomás-Barberán MD. Sensitization profile in patients with respiratory allergic diseases: Differences between conventional and molecular diagnosis (a cross-sectional study). Clin Mol Allergy. 2019;17(1):11. doi: 10.1186/s12948-019-0112-4.
4. Huber P, Becker S, Gröger M. Pitfalls in the diagnosis of house dust mite allergy. HNO. 2024;72(9):619-25. doi: 10.1007/s00106-024-01425-y.
5. Huang J, Xiang R, Tan L, Deng Y, Tao Z, Zhang W, et al. Dust mite component analysis: Identifying key allergens components for effective immunotherapy in allergic rhinitis. Int Immunopharmacol. 2023;125:111111. doi: 10.1016/j.intimp.2023.111111.
6. Calzada D, Bartra J, Serrano C, Riggioni S, Moran E, Maselli J, et al. Differences in molecular sensitization profiles between a Spanish and Latin American mite allergic patients. J Investig Allergol Clin Immunol. 2024;35(2):e968. doi: 10.18176/jiaci.0968.
7. Kowal K, Pampuch A, Siergiejko G, Siergiejko Z, Swiebocka E, Schlachter CR, et al. Sensitization to major Dermatophagoides pteronyssinus allergens in house dust mite allergic patients from North Eastern Poland developing rhinitis or asthma. Adv Med Sci. 2020;65(2):304-9. doi: 10.1016/j.advms.2020.05.003.
8. Di Spigna G. Component resolved diagnosis by recombinant allergens in patients with allergies to inhalants. J Biol Regul Homeost Agents. 2020;34(5):e297. doi: 10.23812/20-297-A.
9. Potapova E, Bordas-Le Floch V, Schlederer T, Vrtala S, Huang HJ, Canonica GW, et al. Molecular reactivity profiling upon immunotherapy with a 300 IR sublingual house dust mite tablet reveals marked humoral changes towards major allergens. Allergy. 2022;77(10):3084-95. doi: 10.1111/all.15327.
10. Villalta D, Scala E, Asero R, Da Re M, Conte M, Buzzulini F. Evaluation and predictive value of IgE responses toward a comprehensive panel of house dust mite allergens using a new multiplex assay: a real-life experience on an Italian population. Eur Ann Allergy Clin Immunol. 2022;54(3):117-22. doi: 10.23822/EurAnnACI.1764-1489.195.

Manuscript accepted for publication

11. Bożek A, Zalejska Fiolka J, Czuba Z, Miodońska M, Kozłowska R. Allergy to *Der p* 23 influences the cytokine profile in patients with allergic asthma – a preliminary study. J Asthma. 2022;59(12):2491-4. doi: 10.1080/02770903.2022.2083635.
12. López-Rodríguez R, Rial MJ, Esteban-Gorgojo I, Veleiro Pérez B, López-Araújo GA, Pérez-Quintero O, et al. Serodominance profile in a dust mite complex region. Int Arch Allergy Immunol. 2022;183(8):843-51. doi: 10.1159/000523869.
13. Ansotegui IJ, Melioli G, Canonica GW, Gomez RM, Jensen-Jarolim E, Ebisawa M, et al. IgE allergy diagnostics and other relevant tests in allergy, a World Allergy Organization position paper. World Allergy Organ J. 2020;13(2):100080. doi: 10.1016/j.waojou.2019.100080.
14. Liu Y, Zhao L, Wang J, Guo Y, Wang Y, Zhang L, et al. Serological analysis of allergic components of house dust mite provides more insight in epidemiological characteristics and clinical symptom development in North China. Front Immunol. 2023;14. doi:10.3389/fimmu.2023.1083755 PubMed PMID: 37180108.
15. Forchert L, Potapova E, Panetta V, Dramburg S, Perna S, Posa D, et al. *Der p* 23-specific IgE response throughout childhood and its association with allergic disease: A birth cohort study. Pediatric Allergy and Immunology. 2022 Jul 1;33(7). doi:10.1111/pai.13829 PubMed PMID: 35871456.
16. Eder K, Becker S, Gellrich D, Zieglmayer P, Gröger M. The Role of *Der p* 23 Sensitization: An Analysis of 474 Patients Sensitized to Mite. Int Arch Allergy Immunol. 2020;181(9):689–98. doi:10.1159/000508522
17. Posa D, Perna S, Resch Y, Lupinek C, Panetta V, Hofmaier S, et al. Evolution and predictive value of IgE responses toward a comprehensive panel of house dust mite allergens during the first 2 decades of life. Journal of Allergy and Clinical Immunology. 2017 Feb;139(2):541-549.e8. doi:10.1016/j.jaci.2016.08.014
18. Biliute G, Miskinyte M, Miskiniene A, Zinkeviciene A, Kvedariene V. Sensitization profiles to house dust mite Dermatophagoides pteronyssinus molecular allergens in the Lithuanian population: Understanding allergic sensitization patterns. Clin Transl Allergy. 2024 Jan 1;14(1). doi:10.1002/clt2.12332
19. González-Pérez R, Poza-Guedes P, Pineda F, Castillo M, Sánchez-Machín I. House Dust Mite Precision Allergy Molecular Diagnosis (PAMD@) in the Th2-prone Atopic Dermatitis Endotype. 2021 Dec 1;11(12). doi:10.3390/life11121418
20. Rodinkova V V., Yuriev SD, Kryvopustova M V., Mokin VB, Kryzhanovskyi YM, Kurchenko AI. Molecular Profile Sensitization to House Dust Mites as an Important Aspect for Predicting the Efficiency of Allergen Immunotherapy. Front Immunol. 2022 Mar 22;13. doi:10.3389/fimmu.2022.848616 PubMed PMID: 35392080.

Manuscript accepted for publication

Figure 1 - Sensitization profiles to major molecular allergens of *Dermatophagoides pteronyssinus* in Skin Prick Tests (A) and sIgE in ALEX2® (B).

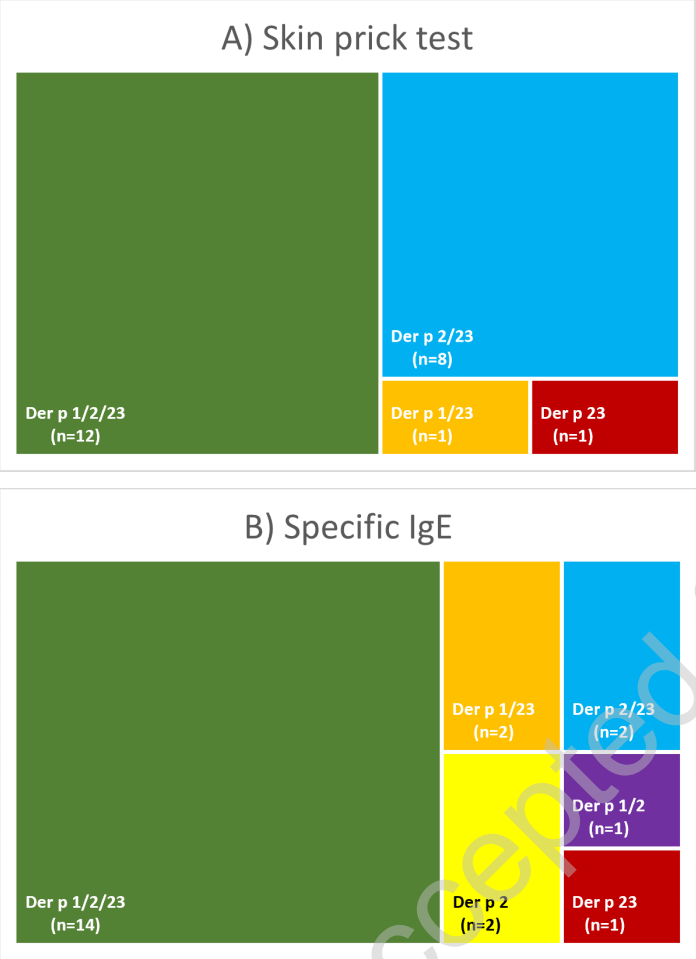


Figure 1 - A) Sensitization profile in Skin Prick Tests to *Dermatophagoides pteronyssinus* major molecular allergens. B) Sensitization profile in specific IgE in ALEX2® to *Dermatophagoides pteronyssinus* major molecular allergens.

Manuscript accepted for publication

	All patients with *in vitro* evaluation		Patients with rhinitis without asthma		Patients with rhinitis and asthma		p-value
	N (%)	**Median [IQR]**	**N (%)**	**Median [IQR]**	**N (%)**	**Median [IQR]**	
Total	22 (100%)	-	13 (100%)	-	9 (100%)	-	
Demographics							N/A
Female	15 (68%)	-	9 (69%)	-	6 (67%)	-	
Age (years)	-	29.5 [22; 40]	-	28 [22; 38]	-	32 [23; 42]	
Total IgE (UI/L)	-	248 [129; 867]	-	194 [127; 440]	-	670 [150; 1257]	n.s.
Positive SPT (mm)							
nDer p 1	13 (59%)	3 [0; 4.5]	6 (46%)	2 [0; 3.5]	7 (78%)	4.0 [3.0; 4.5]	n.s.
nDer p 2	20 (91%)	5 [4.1; 5.8]	12 (92%)	5 [4.5; 5.0]	8 (89%)	5.0 [4.0; 5.0]	n.s.
nDer p 23	22 (100%)	6 [5.1; 8.0]	13 (100%)	7 [5.5; 9.5]	9 (100%)	5.5 [5.0; 7.0]	n.s.
Positive sIgE (k_{UA}/L)							
nDer p 1	17 (77%)	6.8 [2.1; 11.6]	8 (62%)	4.4 [0; 9.2]	9 (100%)	9.4 [6.2; 12.3]	n.s.
rDer p 2	19 (86%)	13.2 [4.1; 37.2]	12 (92%)	17.4 [4.2; 36.7]	7 (78%)	20.1 [4.0; 47.8]	n.s.
rDer p 23	19 (86%)	4.4 [1.6; 9.7]	10 (77%)	5.1 [1.3; 17.7]	9 (100%)	7.7 [2.2; 10.3]	n.s.
Other sIgE (k_{UA}/L)							
rDer p 5	15 (68%)	6.0 [0.1; 12.6]	8 (62%)	3.0 [0.1; 14.0]	7 (78%)	7.2 [1.3; 8.2]	n.s.
rDer p 7	8 (36%)	0 [0; 5.1]	5 (38%)	0 [0; 6.9]	3 (33%)	0 [0; 0.6]	n.s.
rDer p 10	2 (9%)	-	2 (15%)	-	-	-	n.s.
rDer p 11	-	-	-	-	-	-	n.s.
rDer p 20	1 (5%)	1.3 [0; 5.9]	-	0.6 [0; 6.5]	1 (11%)	3.5 [0.5; 4.1]	n.s.
rDer p 21	14 (64%)		7 (54%)		7 (78%)		n.s.
Number of sensitizations to molecular allergens							
1 to 3 allergens	7 (32%)	-	5 (38%)	-	2 (22%)	-	n.s.
4 to 6 allergens	15 (68%)	-	8 (62%)	-	7 (78%)	-	n.s.

Table 1 - Clinical and laboratorial data regarding molecular *Dermatophagoides pteronyssinus* allergens

Legends: p-value shows the statistical difference between patients with and without asthma. N/A - not applicable; n.s. - not statistically significant; SD - standard deviation; sIgE - specific IgE; SPT - skin prick test.

Manuscript accepted for publication

Table 2 - A cross-table between SPT and sIgE frequencies of each molecular allergen profile of *Dermatophagoides pteronyssinus*

Skin Prick Test \ Specific IgE	*Der p* 1+2+23	*Der p* 1+2	*Der p* 1+23	*Der p* 2+23	Only *Der p* 1	Only *Der p* 2	Only *Der p* 23	TOTAL
***Der p* 1+2+23**	10	1	-	1	-	-	-	**12**
***Der p* 1+2**	-	-	-	-	-	-	-	-
***Der p* 1+23**	-	-	1	-	-	-	-	**1**
***Der p* 2+23**	4	-	1	1	-	2	-	**8**
Only *Der p* 1	-	-	-	-	-	-	-	-
Only *Der p* 2	-	-	-	-	-	-	-	-
Only *Der p* 23	-	-	-	-	-	-	1	**1**
TOTAL	**14**	**1**	**2**	**2**	-	**2**	**1**	**22**

Manuscript accepted for publication