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ORIGINAL ARTICLE

Evaluation of sensitization to Der p 1 and Der p 2 in a pediatric population of the North of Portugal☆,☆☆

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Abstract
Introduction: In Portugal, data on the role of Der p 1 and Der p 2 in patients with house dust mite (HDM) allergy are scarce. Allergen-specific immunotherapy (sIT) is the only treatment that improves symptoms, reduces the need for pharmacological therapy and modifies the natural history of the disease. With this study, the authors aim to understand the local epidemiology and to clarify if the molecular assay of major allergens is advantageous in deciding and/or modifying the decision to initiate sIT in children with clinical indication which are sensitized to *Dermatophagoides pteronyssinus*.
Methods: Retrospective study with analysis of patients with asthma and/or rhinitis. Study period: January/2013–December/2016. Inclusion criteria: 1) positive prick-test to *D. pteronyssinus*; and 2) clinically relevant disease under treatment. Assay Der p 1 and Der p 2 values $\geq$0.35 kUA/L were considered positive. Statistical significance was set at $p < 0.05$.
Results: The clinical files of 279 patients. Mean ages 9.55 years (min. 4–max. 17). Asthma was present in 199 children (71.3%) and rhinitis in 245 (87.8%). Der p 1 and Der p 2 was <0.35 kUA/L in 29 (10.4%) patients. The value of Der p 1/Der p 2 correlated with the size of the prick-test papule, the value of the eosinophils and the total IgE.
Conclusions: Der p 1 and Der p 2 are dominant allergens in our population and there may be benefits in determining these molecular allergen levels in patients with a positive prick-test and a clinical indication for sIT prior to a decision of initiating sIT or not.

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Dermatophagoides pteronyssinus antígeno p 2

Evaluación de la sensibilización a Der p 1 y Der p 2 en una población pediátrica del Norte de Portugal

Resumen
Introducción: En Portugal los datos del papel de Der p 1 y Der p 2 en niños con alergia al ácaro del polvo son escasos. La inmunoterapia específica (IE) con alérgenos es el único tratamiento que mejora los síntomas, reduce la necesidad de terapia farmacológica y modifica la historia natural de la enfermedad. Con este trabajo, los autores estudian la epidemiología local y buscan aclarar si el análisis molecular de los alérgenos principales es una ventaja para decidir y/o modificar la decisión de iniciar IE en niños con indicación clínica y sensibilizados a *Dermatophagoides pteronyssinus*.
Métodos: Estudio retrospectivo de los niños con asma y/o rinitis. Período de estudio: enero de 2013 a diciembre de 2016. Criterios de inclusión: 1) prick-test positivo a *Dermatophagoides pteronyssinus*; y 2) enfermedad clínicamente relevante bajo tratamiento. Los valores de Der p 1 y Der p 2 $\geq$ 0,35kUA/l fueron considerados positivos. La significación estadística se estableció en $p < 0,05$.
Resultados: Se incluyeron en el estudio 279 pacientes. Edad media 9,55 años (min. 4-máx. 17). El asma estuvo presente en 199 niños (71,3%) y rinitis en 245 (87,8%). Der p 1 y Der p 2 fue < 0,35 kUA/l en 29 (10,4%) pacientes. Der p 1/Der p 2 se correlacionó con el tamaño de la pápula de prick-test, con el valor de los eosinófilos y la IgE total.
Conclusiones: Der p 1 y Der p 2 son alérgenos dominantes en nuestra población y puede haber beneficios en la determinación de estos niveles de alérgenos moleculares en pacientes con un prick-test positivo e indicación clínica para IE.

Introduction

The prevalence of allergic diseases has increased rapidly over the past few decades in developed countries.[1,2] Asthma, rhinoconjunctivitis, and eczema were systematically evaluated in approximately 1.2 million children in 98 countries in the International Study of Asthma and Allergies in Childhood (ISAAC)[3] and a Portuguese epidemiological study in adults revealed a prevalence of 16.8% of asthma and 33.6% of rhinitis in central Portugal.[4] Inhalant allergens play a crucial role in the development of these diseases, with house dust mites (HDM) considered the most important allergen source worldwide.[5,6] HDM, especially *Dermatophagoides pteronyssinus*, are considered an important source for allergen sensitization and are major risk factors for allergic respiratory diseases in genetically predisposed patients.[7] These allergens are divided into groups according to their biochemical composition, homology, and molecular weight. Presently, 20 HDM allergens for *D. pteronyssinus* have been registered by the World Health Organization and International Union of Immunological Societies Allergen Nomenclature Sub-committee (http://allergen.org/), many of these represent digestive enzymes since HDM feces are the major source of allergen exposure.

Some studies report a dominant prevalence of IgE antibodies against group 1 (Der p 1) and group 2 (Der p 2) HDM allergens in Europe.[8–11] In Portugal, data on the role of Der p 1 and Der p 2 are still scarce.

The group 1 (Der p 1, 25 kDa cystein proteases) allergens are found in high concentrations in fecal pellets, while those of group 2 (Der p 2, 14 kDa) are mostly located in components of the mite body.[7,12] Der p 1 and Der p 2 are considered major allergens of *D. pteronyssinus*, as they are recognized in more than 80% of mite-sensitive patients.[11,13]

Allergen-specific immunotherapy (sIT) is an important weapon in the treatment of respiratory allergy in selected cases, and provided that the patient has a hypersensitivity reaction mediated by IgE. The procedure requires a gradual administration of increasing amounts of an allergen to which the patient is sensitive, allowing the modulation of the untoward immune response to that allergen and alleviating allergic symptoms. It is the only treatment that improves symptoms, reduces the requirement of pharmacological therapy and modifies the natural history of allergic disease.[14–16] The therapeutic effect may be long-lasting and prevents the progression from mild to severe forms of allergic disease.[16–18]

Since currently marketed vaccines are standardized only for the Der p 1 and Der p 2 allergens, the authors aim to understand the local epidemiology and to clarify if the molecular assay of these two major allergens is advantageous in deciding and/or modifying the decision to initiate sIT in children sensitized to *D. pteronyssinus* and with clinical indication, similarly to what is described in the literature.

Methods

Patients

The authors performed a retrospective study with analysis of the clinical files of patients referred to the outpatient Clinic of Pediatric Allergology of Centro Hospitalar de