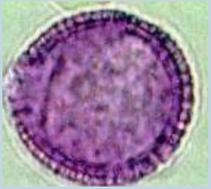


Molecular Profiling of Olive Pollen in a Peruvian Population



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Background

Respiratory sensitisation and allergic asthma are defined as IgE-mediated immune responses to aeroallergens that affect the airways, exhibiting specific sensitisation profiles influenced by geographical environmental conditions. Aerobiological studies conducted in Tacna city (main olive growing area), since 2014 to 2018, have revealed relevant pollen levels from different allergenic sources, with particularly high counts of *Olea europaea* pollen (1,000 grains/m³). Advances in Precision Allergy Molecular Diagnosis (PAMD@) allow for the identification of individual specific IgE profiles in allergic patients, enabling accurate diagnoses and tailored treatments. This study aimed to investigate molecular profile of olive pollen sensitisation in an exposed Peruvian population.

Methods

Consecutive patients attending "Clínica Santa Isabel – Tacna city" with rhinitis and/or asthma symptoms were recruited from April to May 2024. Skin-prick testing (SPT) (Inmunotek, Madrid, Spain) was conducted for aeroallergens, including dust mites, moulds, pollens, and animal epithelia. Sera from sensitised patients were analysed using the ALEX MacroArray platform (MacroArray Diagnostics, Vienna, Austria) to determine specific IgE profiles, and sera from olive allergic patients were further analysed by Western blot.

Results

We enrolled 43 patients (23 F/20 M, median age 40, range 4-84). SPT results identified mites as the most frequent sensitising source (95.34%), followed by pollens (69.77%), epithelia (23.26%), moulds (11.62%) and cockroaches (6.97%). Among pollens, 28 of 43 (65%) were SPT positive to *O. europaea*. Of these, 19 patients showed specific IgE positive to Ole e 1 (94.73%), Ole e 7 (5.26%) and/or Ole e 9 (15.79%), while 9 patients had no detectable IgE (<0.35 kU/L) to olive allergens using the ALEX platform. Western blot analysis revealed bands at various molecular weights, including some corresponding to Ole e 1, 7, and 9, but also others potentially representing allergens not covered by current molecular platforms.

Conclusion

The results show that *Olea europaea* is the main source of sensitisation among pollen in the Tacna population with rhinitis and/or asthma, with Ole e 1 as the predominant allergen. The combination of SPT, molecular platforms, and Western blot allowed the detection of allergens not currently included in molecular platforms. These findings highlight the need for further investigation of local molecular sensitisation profiles and stress the importance of precise, personalised diagnostics for optimal allergy management.

