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#61 Abstract

Influence of climate change on pollen counts and pollinosis in Madrid, a study over 40 years.

Environmental allergy and climate change / Airborne allergens

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Background
We aimed to verify if the increase of temperature over 40 years, is affecting the aerobiological and clinical behavior of the main allergenic pollen concentrations in Madrid.

Method
Pollen counting was carried out from 1979 to 2018 using Hirst-type volumetric collectors. Meteorological data from the Madrid-Barajas station located at 9 km, were used. The beginning and the end of the season were considered as the first day for three consecutive days>10 and the last day for three consecutive days>10 grains/m^3.
The prevalence of positive skin tests (PST) was studied among patients with pollinosis in 1979 (n=100), 1994 (n=316) and 2019 (n=100) patients.
Descriptive statistics, grouping average data for successive five-year periods, non-parametric correlations (Spearman's rho) to assess the effect of temperature on pollen concentrations and on skin sensitization, were carried out.

Results
A significant 1.3 ºC increase in 5-year mean temperature records over 40 years in Madrid, was observed (r_s=0.81, p=0.014).
5-year mean total pollen concentrations with temperature provided significant correlations (r_s=0.74; 0.90 and 0.71; p=0.037; p=0.002 and p=0.047, for Cupressaceae, *Platanus*, and *Quercus,* respectively).

An advance at the beginning was observed on Cupressaceae -18 days that correlate significantly with the 5-year mean temperature (r_s=-0.76 p=0.18), *Olea* -8 days ($r_{s=}$-0.71, p=0.047) and almost significant in the case of Poaceae -7 days (r_s=-0.690, p=0.058). An advance, but not significant was observed on *Quercus* and *Platanus:* -7, -6 and -2 days, respectively.

An advance, but not significant at the end of the season was observed on Poaceae, Amaranthaceae and *Olea* [-7, -6, and -1 days, respectively).
A significant increase in the 5-year mean pollen season duration, was observed only for *Quercus* (7 days, r_s=0.90; p=0.002).

An increase, but not significantly in the 5-year mean pollen duration was observed on Cupressaceae and *Platanus*. On the contrary, a decrease, but not significant, was observed on Poaceae *Olea* and Amaranthaceae pollen season durations: -3, -1 and -6, days, respectively.
An increase of the PST was observed for *Cupressus arizonica* (0%, 20%, 59%) *Platanus acerifolia* (2%, 52%, 56%), *Quercus rotundifolia* (0%, 14%, 22%) respectively.

Conclusion

The increase of temperature over 40 years in Madrid, could have modified the global pollen load and affected the rate of the Cupressaceae, *Platanus* and *Quercus* allergic sensitization in this city.