XV MIĘDZYNARODOWY KONGRES POLSKIEGO TOWARZYSTWA ALERGOLOGICZNEGO

Co-exposure to highly allergenic airborne pollen and fungal spores in Europe

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Introduction

The study was aimed at determining the potential spatiotemporal risk of the co-occurrence of allergenic airborne pollen and fungal spore high concentrations in different bio-climatic zones in Europe. Specifically the number and timing of co-occurrence days, their long-term trends and general dependency on bioclimatic variables across European were investigated.

Material and methods

Birch, grass, mugwort, ragweed, olive pollen and Alternaria and Cladosporium fungal spores were investigated at 16 sites in Europe, in 2005–2019. All the sites met the minimum requirements for aerobiological monitoring. Meteorological data in daily resolution were obtained from the OGIMET database by a climate R package, only thermal and precipitation variables were used to characterize climatic conditions of a particular site to meet Köppen-Geiger classification. HC days corresponded to a days when daily spore or pollen concentrations exceed specific threshold values (100 pollen/m3 for birch and olive, 50 pollen/m3 for grasses, mugwort and ragweed). In the case of fungal spores, the threshold values of 100 spores/m3 for Alternaria and 3,000 spores/m3 for Cladosporium were considered.

Results

In Central and northern Europe, pollen and fungal spore seasons mainly overlap in June and July, while in South Europe, the highest pollen concentrations occur frequently outside of the spore seasons. In the coldest climate, no allergy thresholds were exceeded simultaneously by two spore or pollen taxa, while in the warmest climate most of the days with at least two pollen taxa exceeding threshold values were observed. The annual air temperature amplitude seems to

be the main bioclimatic factor influencing the accumulation of days in which Alternaria and Cladosporium spores simultaneously exceed allergy thresholds.

Conclusions

The phenomenon of co-occurrence of airborne allergen concentrations gets increasingly common in Europe and is proposed to be present on other continents, especially in temperate climate. Non-overlapping periods of high pollen or spore concentration that consecutively follow each other with only short gaps in between might markedly affect the health of sensitized people, prolonging their exposure to allergens.

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