Aerobiological behavior of some allergenic fungal spores in the atmosphere of Medellin (Colombia) during a year of study

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Respiratory allergies are a common consultation motive in general medicine and its treatment often is limited to mitigate the symptoms. Few times, patients are referred to the specialist for its correct diagnosis and the application of a suitable therapy. Nevertheless, in an important number of cases, is not possible to determine the cause, thus due to both, the ignorance of the local epidemiology and the allergens presents in the region. In Medellin around 30 % of the population suffers some allergic disease associated primarily with mites, epitheliums of pets and cockroach. Pollen allergy and fungal spores apparently is not common as in other regions of North America and Europe; however, the methods employs for its diagnosis in Medellín include common allergens in tempered countries, which might be different to those found in tropical areas. With the intention of knowing the mycotic air flora and its behavior associated with the meteorological conditions in the city of Medellin, a continuous air sampling during the year 2010 was realized using a Burkart sampler, which was located in central area of the city. A count of total spores and the identification of some taxa considered important allergens according the scientific literature were done. The allergenic taxa included in this study were the conidia of Alternaria spp, Cercospora spp, Cladosporium spp, Curvularia spp, Drechslera spp/Bipolaris spp, Epicoccum spp, Penicillium spp/Aspergillus spp, Pithomyces spp, Stemphylium spp, Torula spp, and the ascosporas of Paraphaeosphaeria spp and Pleospora spp. Among the most outstanding results, we found counts of total spores ranged between 114 and 26532 spores/m3, with predominance of high values (higher than 5000 spores/m3) in 240 days of the year. Transparent basidiospores and ascospores were the most abundant taxa, overcoming 90% of the total spores in all sampled days. In contrast to those observed in other studies, there was not demonstrated a marked effect of temperature, relative humidity or rain regimes on the total spore counts. Cladosporium spp and Penicillium spp/Aspergillus spp conidia were the most common allergenic spores presents in the air of Medellin, they appearing in 98 % and 93 % of analyzed days, respectively. Notwithstanding, the concentration of these conidia never exceeded 2% of total spores (maximum concentrations was

3055 and 586 spores/m3, respectively). Conidia of Alternaria were detected in the air in 77% of the evaluated days at very low concentrations (maximum value was 20 spores /m3). Others taxa had occasional appearance in low concentrations. Only the levels of Cladosporium spp and Penicillium spp/Aspergillus spp showed positive correlation with the temperature, meanwhile a negative correlation was observed with relative humidity and rainfall. Cladosporium spp showed the highest levels during the first months of the year, staying low and constant during the rest of the year; Penicillium spp/Aspergillus spp conidia were constant during the evaluated period. In conclusion, important differences were found between the fungal flora of the atmosphere of Medellin compared with those of temperate zones where the levels of total spores usually are significantly smaller and have a seasonal behavior. Regarding conidia of Alternaria spp, the main allergenic fungus. These conidia were found in very low concentrations, unlike that found in Europe and the United States where it is often a common taxon mycoflora. These findings support the needed to maintain a permanent monitoring of fungal spores in the air of the city of Medellin, in order to determine its variations across the time and the influence of meteorological parameters on its levels and biodiversity. A larger number of taxa must be identified and determine their allergenicity in the population of the city, in order to determine the native allergens, and in the future design diagnostic kits and extracts of fungi of local importance for use in hyposensitizing treatment.

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