Hialine project: allergen release from pollen across Europe

Buters J.[1], Galán C.[2], Thibaudon M.[3], Smith M.[4], Brandao R.[5], Antunes C.[5], Torres C.[2], Albertini R.[6], Grewling L.[7], Rantio-Lehtimäki A.[8], Celenk S.[9], Sofiev M.[10], Sauliene I.[11], Cecchi L.[12]
[1]University of Munish, Germany
[2]University of Córdoba, Spain
[3]Réseau National de Surveillance Aerobiologique, France
[4]Medical University of Vienna, Austria
[5]University of Evora, Portugal
[6]University of Parma, Italy
[7]Adam Mickiewicz University, Poland
[8]University of Turku, Finland
[9]University of Uludag, Turkey
[10]Finnish Meteorological Institute, Finland
[11]Siauliai University, Lithuania
[12]University of Firenze, Italy

Objectives: Exposure to allergens is one of several factors determining sensitization and allergic symptoms in individuals. Exposure to aeroallergens from pollen is assessed by counting allergenic pollen in ambient air. However, proof is lacking that pollen count is representative for allergen exposure. Exposure to allergen is poorly monitored by only monitoring pollen count. Monitoring the allergen itself in ambient air might be an improvement in allergen exposure assessment as has been demonstrated in a prior study in the frame of the MONALISA project. The main objective of the HIALINE-project has been to implement an outdoor allergen early warning network, in addition to the pollen forecasts. Monitoring the allergens themselves together with pollen in ambient air might be an improvement in allergen exposure assessment. It has been also investigated whether meteorological factors in an effort to predict the effect of climate change on the allergenicity of pollen.
Methods: Airborne pollen and the major allergens from the top 3 airborne allergens in Europe (Phl p 5, Bet v 1 and Ole e 1) have been sampled across 9 European countries during 2009-11. Airborne pollen has been measured by using a Hirst type volumetric spore trap. Aeroallergens have been collected with a ChemVol®2400 high-volume cascade impactor, being extracted and analyzed by allergen specific ELISA´s. Particulate matter (PM) in ambient air was fractioned into >PM10 (XL) and 10 µm > PM > 2.5 µm (M). Allergen forecast has been calculated by incorporating the SILAM chemical transport model and compared with the observations of HIALINE.
Results: In general it has been observed similar profiles for airborne pollen and aeroallergens content in the air, being aeroallergens more associated to XL fraction stage. On the other hand, it has been detected allergenic activity out from pollen season, especially in the case of M stage. Smaller particles are more exposed to medium-long distant transport. Moreover, results have provides strong evidence that similar value of airborne pollen evokes different ambient air allergen loads in different geographical areas. Even more, when the same area is considered the allergen load of the poilen can vary within the season. Pollen differs in allergen release between European countries. Our study supports the importance of the aeroallergen quantification together with airborne pollen counts, in order to define the outdoor air allergenic load.
Conclusions: Under these results, the expected outcomes are the implementation of a network of European outdoor allergen measurements to better predict allergic symptoms. Also the climatic factors that govern allergen exposure in outdoor air will be established. These can be used to calculate the effect of climate change on the health effects of airborne allergens. Polleninfo.org offers a new tool on Patient's Hayfever Diary (PHD).

Short-term effects of exposure to birch, grass and ragweed pollen on clinical sym of pollinosis in a panel study of 200 patients in France

Thibaudon M.[1], Clot B.[2], Martin S.[3], Segala C.[3], Besancenot J.[1], Caillaud D.[4]
[1]RNSA, Brussieu, France
[2]MeteoSwiss, Payerne, Switzerland
[3]SEPIA-SANTE, Baud, France
[4]CHU Clermont-Ferrand, France

Objectives: Few panel studies on the relationship between the concentration of ai allergenic pollen and intensity of symptoms have been so far carried out with a sign number of hay-fever patients and adequate statistical methods. The present study aim comparing daily recorded symptoms of allergic patients with airborne pollen concentrati birch, grasses and ragweed.
Methods: Three different panels were used: for birch 61 patients (March-April 201 grasses 106 patients (April-August 2010), and for ragweed 37 patients (July-September and 2010). RNSA and MeteoSwiss provided the pollen data. Statistical analysis for corre data was used (Generalized estimating equations and Generalized additive mixed model the symptoms (rated from 0 to 3).
Results: The proportion of patients having symptoms to birch pollen with serious nasal, o and bronchial symptoms was linear up to pollen concentrations of 110, 70 and 70 grain respectively and reached a plateau above these thresholds. For an increase of 10 gr m3, odds ratios (OR) were 2.01, 4.80 and 2.97, respectively. For grass pollen the increa nasal and ocular symptoms was linear up to 80 and 90 grains/m3 respectively. An increas 10 grains/m3 resulted in an increase of ocular and nasal symptoms (OD 1.06 and 1.08). relation between bronchial symptoms and pollen was linear (OR: 1.026). The rate of pati with various types of symptoms increased in a linear and significant way with exposur ragweed pollen, more in 2009 than in 2010. For an increase of 10 grains/m3, OR of oc symptoms was 1.324 in 2009 and 1.049 in 2010. No trigger threshold was observed for ar these three pollen types.
Conclusions: The clinical response in sensitized patients exposed to pollen varied du the pollen season. With increasing birch pollen concentrations, nasal, ocular and bronc symptoms increased up to a saturation point when symptoms were maximal for all patie For grasses pollen, nasal and ocular symptoms similarly increased up to a saturation point. relationships between bronchial symptoms and grasses one the one hand and all sympto and ragweed pollens on the other are linear. This seems to be related to the slow but continuo increase in the number of patients having these symptoms throughout the season.