Dokumenttyp: journal article

Autor(en) des Beitrags:
Buters, JTM; Thibaudon, M; Smith, M; Kennedy, R; Rantio-Lehtimaki, A; Albertini, R; Reese, G; Weber, B; Galan, C; Brandao, R; Antunes, CM; Jager, S; Berger, U; Celenk, S; Grewling, L; Jackowiak, B; Sauliene, I; Weichenmeier, I; Pusch, G; Sarioglu, H; Ueffing, M; Behrendt, H; Prank, M; Sofiev, M; Cecchi, L; HIALINE Working Grp

Titel des Beitrags:
Release of Bet v 1 from birch pollen from 5 European countries. Results from the HIALINE study

Abstract:
Exposure to allergens is pivotal in determining sensitization and allergic symptoms in individuals. Pollen grain counts in ambient air have traditionally been assessed to estimate airborne allergen exposure. However, the exact allergen content of ambient air is unknown. We therefore monitored atmospheric concentrations of birch pollen grains and the matched major birch pollen allergen Bet v 1 simultaneously across Europe within the EU-funded project HIALINE (Health Impacts of Airborne Allergen Information Network). Pollen count was assessed with Hirst type pollen traps at 10 l min\(^{-1}\) at sites in France, United Kingdom, Germany, Italy and Finland. Allergen concentrations in ambient air were sampled at 800 l min\(^{-1}\) with a Chemvol (R) high-volume cascade impactor equipped with stages PM\(>\) 10 \(\mu\)m, 10 \(\mu\)m \(>\) PM\(>\) 2.5 \(\mu\)m, and in Germany also 2.5 \(\mu\)m \(>\) PM\(>\) 0.12 \(\mu\)m. The major birch pollen allergen Bet v 1 was determined with an allergen specific ELISA. Bet v 1 isoform patterns were analyzed by 2D-SDS-PAGE blots and mass spectrometric identification. Basophil activation was tested in an FC epsilon R1-humanized rat basophil cell line.
passively sensitized with serum of a birch pollen symptomatic patient. Compared to 10 previous years, 2009 was a representative birch pollen season for all stations. About 90% of the allergen was found in the PM> 10 μm fraction at all stations. Bet v 1 isoforms pattern did not vary substantially neither during ripening of pollen nor between different geographical locations. The average European allergen release from birch pollen was 3.2 pg Bet v 1/pollen and did not vary much between the European countries. However, in all countries a> 10-fold difference in daily allergen release per pollen was measured which could be explained by long-range transport of pollen with a deviating allergen release. Basophil activation by ambient air extracts correlated better with airborne allergen than with pollen concentration. Although Bet v 1 is a mixture of different isoforms, its fingerprint is constant across Europe. Bet v 1 was also exclusively linked to pollen. Pollen from different days varied> 10-fold in allergen release. Thus exposure to allergen is inaccurately monitored by only monitoring birch pollen grains. Indeed, a humanized basophil activation test correlated much better with allergen concentrations in ambient air than with pollen count. Monitoring the allergens themselves together with pollen in ambient air might be an improvement in allergen exposure assessment. (C) 2012 Elsevier Ltd. All rights reserved.