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Title: European symposium on the awareness of allergy: report of the promotional campaign in the European Parliament (April 26-28, 2016)

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Abstract

From the 26th to the 28th of April 2016, an allergy awareness campaign was organized by the European Academy of Allergy and Clinical Immunology (EAACI) and the European Federation of Allergy and Airway Diseases Patients Associations (EFA) in the European Parliament in Brussels, with support of the European Parliament's Interest group on Allergy and Asthma and was co-hosted by the Members of the European Parliament (MEP) David Borrelli, Sirpa Pietikainen and Nessa Childers. Skin prick tests (SPT) were performed to gain attention for the increasing prevalence of allergic airways diseases in Europe. Since more than 30% of the total European population suffers from airways allergies and asthma, reaching a higher level of awareness and elaboration of an active prevention plan is mandatory.

Of the 406 individuals undergoing SPT in the European Parliament, 211 participants (52%) reported to have suffered from an allergy in the past, with allergic symptoms being present in the nose and eyes (40% and 36% respectively), the skin (27%), lower airways (14%) and the gut (8%). Of the 381 SPT with reliable results, cutaneous hypersensitivity was

found in 201 (53%) participants. Of those with positive SPT (n=201), 70 participants (35%) were monosensitized while 131 participants (65%) were polysensitized. The positive skin reactions were found mostly for grass pollen (n=108), followed by *Dermatophagoides pteronyssinus* (n=105), *Dermatophagoides farina* (n=96) and birch pollen (n=85). Of note, 54 individuals (14% of the total tested population) without reported allergy or allergic symptoms, showed a positive SPT without clinical relevance.

This report summarizes the main idea and goals of the symposium: chronic airway diseases are a major and growing health problem in Europe. Therefore a joint preventive action plan needs to be developed for a better health status of European citizens.

Introduction

The prevalence of chronic allergic airway diseases, such as asthma, rhinitis and rhinosinusitis, has increased enormously in the past decades, reaching approximately 150 million citizens in Europe ^{1, 2}. Besides the annual estimate cost of 17.7 billion euros, chronic allergic airway diseases also have a high burden on daily living and productivity ³. Indeed, a total loss of more than 100 million working days or school days in Europe is associated with the prevalence of rhinitis and asthma ^{4, 5}.

The socio-economic impact of chronic airways diseases cannot be underestimated, as they represent the most frequently diagnosed non-communicable chronic diseases in the European Union. Despite the available treatment options for the different chronic airway diseases, still a percentage of patients are uncontrolled, opening the field for precision medicine in this medical field ^{6, 7}. In this regards, a symposium was organized in the European Parliament in October 2015 under guidance of the European Parliament Interest Group on Allergy and Asthma to promote precision medicine as a novel approach in medical care for allergies and

airways diseases ^{8, 9}. Hosted by the European Parliament Interest Group and MEPs David Borrelli, Sirpa Pietikainen and Nessa Childers, a promotional campaign was organized from 26 -28 April 2016 in the European Parliament in Brussels by the European Academy of Allergy and Clinical Immunology (EAACI) and the European Federation of Allergy and Airway Diseases Patients Associations (EFA) (Figure 1).

During these 3 days of the Awareness Campaign, skin prick testing was performed to gain attention for allergic airway diseases, and its increasing prevalence with major socio-economic impact. Skin prick testing, in combination with the clinical history of the patients, represent the cornerstone for diagnosis of allergic airway diseases ¹⁰⁻¹². Our results confirm the high prevalence of sensitization to inhalant allergens. Nonetheless, a small group of people with a positive skin test did not report any airways symptoms, representing a group of sensitized subjects that might develop symptoms in the future.

In conclusion, the momentum is generated that chronic allergic disease are rising and a united European strategic plan should be developed to tackle this major health problem affecting all generations.

Materials & Methods

Study design

This study included a total 406 individuals working in the European parliament. Before skin prick tests, all participants filled in a questionnaire about their history of allergy. The questionnaire can be found in Table 1.

Skin prick testing

All individuals underwent skin prick testing with the following allergens: birch pollen, grass pollen, cat dander, dog dander, *Dermatophagoides pteronyssinus* and *Dermatophagoides farina* (Stallergenes, S.A., France). A positive control (histamine dichlorhydrate 10 mg/ml) and a negative control (saline) were used for interpreting the results. Skin prick testing was performed by applying a droplet of the allergen extract on the volar forearm in a standardized order (Figure 2) according to the method described previously^{13, 14}. Fifteen to twenty minutes after the skin tests, the contours of the tested allergens were interpreted by a panel of medical doctors and the results were transferred to a database for further analysis.

Results

History of existing allergy

Participants were asked about their knowledge of ever having experienced allergic symptoms or diagnosis of allergy. Of the 406 participants, 211 participants (52%) reported to have suffered from an allergy in the past. In those with previous suspicion of allergy diagnosis, allergic symptoms mainly were manifested in the nose and eyes (40% and 36% respectively) followed by the skin (27%), lower airways (14%) and the gut (8%). Twenty-eight % of the participants reported to have been treated for an allergy in the past, while 15% reported to have had a severe allergic reaction to food/insect bites in the past.

Skin prick testing

Skin prick tests were performed in a standardized way (Figure 2) and cutaneous hypersensitivity was evaluated by a team of medical doctors of EAACI. Of the 406 SPT performed, 25 (6%) of them were excluded because of a negative positive control (histamine) or a positive negative control. Of the 381 skin prick tests with reliable results, cutaneous hypersensitivity was found in 201 (53%) participants. Of those, 70 participants (35%) were monosensitized while 131 participants (65%) were polysensitized (Table 2). The most positive skin reactions were found for grass pollen (n = 108), followed by *Dermatophagoides pteronyssinus* (n = 105), *Dermatophagoides farina* (n = 96) and birch pollen (n = 85). Only 69 and 49 positive skin prick tests were found for cat and dog dander respectively.

Subgroup analyses showed that 54 individuals (14% of the total tested population) without reported allergy or allergic symptoms had a positive SPT (Figure 3), while 55 individuals (14 % of the total tested population) showed a negative SPT despite self-reported allergic symptoms or allergy.

Discussion

This report of the awareness campaign in the European Parliament in Brussels in April 2016, underscores the high prevalence of allergic diseases in Europe, consistent with other studies on high prevalence of allergic symptoms and sensitization to inhalant allergens in Europe ^{6, 15}. During the three-days campaign in the European Parliament, a total of 406 participants were tested for allergy for the most common aeroallergens. Of all the skin prick tests performed, 6% of them were excluded because of a negative positive control (histamine) or a positive negative control (saline). A negative positive control was due to the fact that

some individuals (n = 12) were on antihistamines or other drugs, which interfered with our skin tests^{14, 16}. A positive skin prick test to our panel of inhalant allergens was found in 53% of the tested participants, which was associated with self-reported allergy or allergic symptoms in the majority of the positive tests (73%). This high prevalence of sensitization can be explained by the expected higher interest of allergic people to get SPT performed for diagnostic or confirmatory reasons. Despite the bias towards high sensitization, our data underscore the high prevalence of major health care concern of airways allergies in Europe. Of note, we only tested a limited number of inhalant allergens excluding allergens with a low sensitization profile.

Interestingly, 54 participants with positive SPT (14% of the total tested population) did not report being aware of any allergy disease. This observation of non-relevant sensitization is important in the light of the clinical interpretation of SPT in clinical practice, as the consistency of SPT results with the patients' history is crucial for the correct diagnosis and design of treatment plan. Of note, 7% of the study participants reported to have allergies for food allergens, underlying the allergic march in Europe.

Taken together, with this awareness campaign we wanted to highlight and reconfirm the high prevalence of sensitization to inhalant allergens as risk factor for chronic airway disease in Europe.

Conflicts of interest

The authors declare that they have no conflicts of interest.

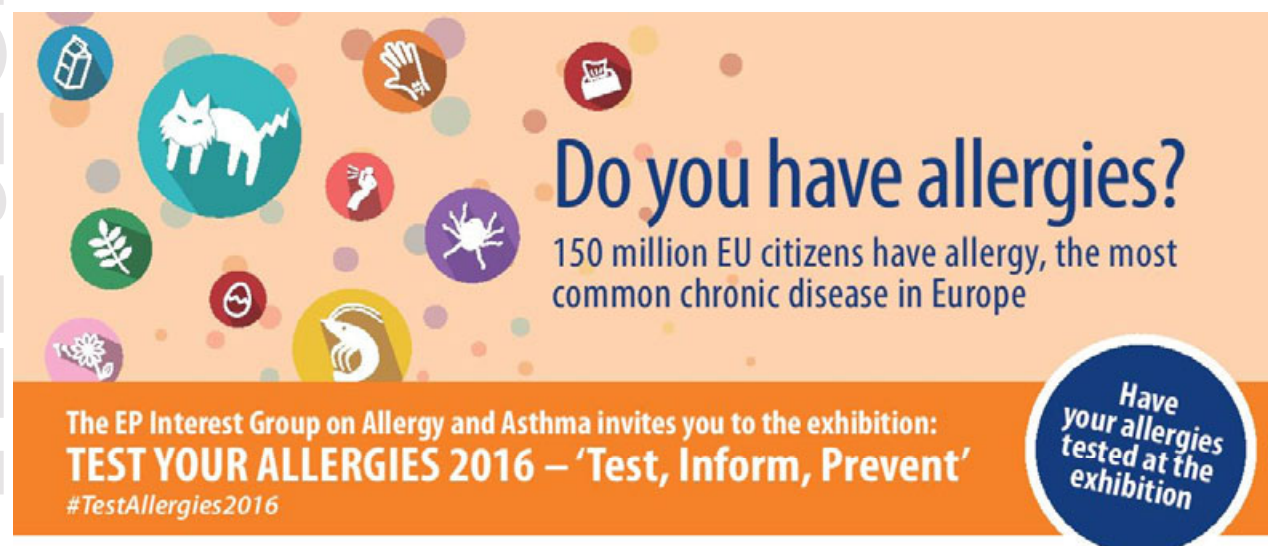
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Figure legends

Figure 1: Test your allergies 2016



Exhibition and Allergy Testing: **26–28 April 2016**, Mezzanine Yehudi Menuhin (PHS, Floor 2)
Opening Cocktail Meeting: **26 April 2016, 17:00–19:00**, Members Salon

With the support of:



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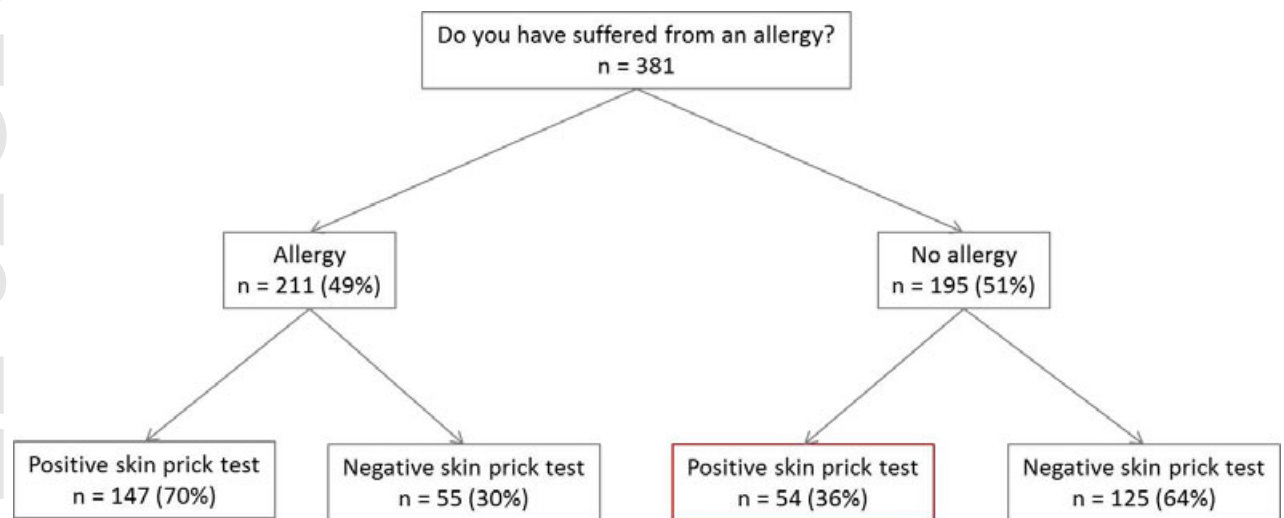
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Figure 2: Standardized way of performing skin prick testing. A droplet of the allergen is placed on the forearm of each participant following a standardized protocol: 1, positive control; 2, negative control; 3, *Dermatophagoides pteronyssinus*; 4, grass pollen; 5, birch pollen; 6, cat dander; 7, dog dander and 8; *Dermatophagoides farinae*. A small plastic needle was used to press through the drop of allergen extract. Fifteen to 20 minutes later, the contour of the allergic reaction on the forearm was evaluated by a medical doctor.



Figure 3: Sensitization to aeroallergens in individuals without allergy.



Tables

Table 1: Questionnaire to check existing allergy

1. Have you suffered an allergy in the past?
2. If yes, what organ was involved in the allergy?
 - Nose
 - Lower airways/lung
 - Eyes
 - Skin
 - Gut
3. Have you ever been treated for an allergy in the past?
4. Have you ever had a severe allergic reaction to food/insect bites?

Table 2: Results of skin prick testing

Negative skin prick test	180 (47%)
Positive skin prick test	201 (53%)
Monosensitization	70 (35%)
Sensitization for 2 allergens	56 (28%)
Sensitization for 3 allergens	38 (19%)
Sensitization for 4 allergens	16 (8%)
Sensitization for 5 allergens	10 (5%)
Sensitization for 6 allergens	10 (5%)