Characterization of Self-Reported Pollen Food Syndrome (PFS) in Birch Allergic Subjects Exposed to Birch Pollen in an Environmental Exposure Chamber (EEC) in Canada

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Abstract #742

Introduction

- Pollen Food Syndrome (PFS) is an allergic reaction to fruits, vegetables and/or nuts that is commonly associated with pollen (i.e. oak and birch) allergy due to food and pollen similar allergen protein homology.
- There is little data on PFS comorbidity with tree allergy in Canada. This post-hoc analyses examined the frequency of self-reported PFS, PFS phenotypes and Total Symptom Scores (TSS) reported by birch allergic patients exposed to oak pollen in an Environmental Exposure Chamber (EEC).

Methods

- A total of 219 subjects with a history of birch allergy specific IgE and SPT positive were studied during out-of-pollen allergy season.
- Subjects were exposed in the EEC to birch pollen (3500±500 pollen grains/m3) for 6 hours and their TSS was recorded every 30 minutes. The subjects also reported in a questionnaire their allergic reaction responses to specific types of food. Their PFS status was determined using a PI algorithm adapted from Skypala et al., 2011. (1)
- PFS data was phenotyped with descriptive statistics and the TSS recorded in the EEC was compared between PFS-positive and PFS-negative subjects using unpaired t-tests.

Results

Figure 1. The Cliantha Research EEC facility located at Mississauga, Ontario, Canada. Subjects were exposed to the pollen allergen continuously for approximately 6 hours.

Figure 2 Subjects recorded their TSS symptoms using an electronic Patient Data Acquisition Tablet™ (ePDAT™) inside the EEC.

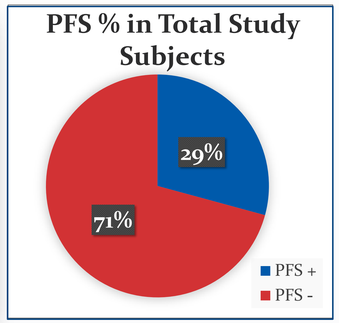

Figure 3 Out of the total 219 subjects randomized in this study, 29% (64) were found to be PFS-positive and 71% (155) were PFS-negative.

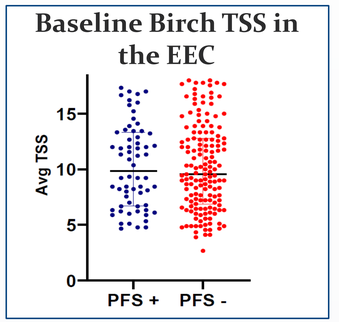

Figure 4 The average of TSS recorded in the EEC from all subjects was 10.30 for PFS-positive subjects and the average TSS was 10.18 for PFS-negative subjects. Unpaired t-test showed a p-value of 0.83. The average TSS for PFS+ and PFS- did not differ significantly.

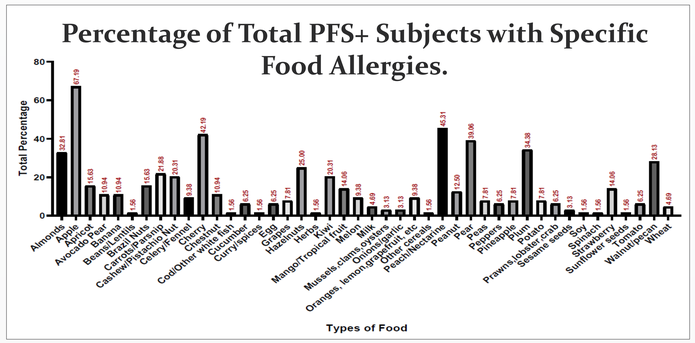

Figure 5. The highest food allergy reported in PFS-positive subjects was Fruits/Vegetables (84.3%), followed by Nuts (53.1%), then Potatoes/ Root Vegetables (10.9%) were = Milk/Eggs/Chicken (10.9%), Fish/Shellfish (7.8%), Beansprouts/Salad Leaves/Herbs (4.7%) were = Wheat/ Other Cereals (4.7%), and Beans/Lentils/Chickpeas/Legumes (3.1%) were = Other Food (3.1%).

Conclusion

- This analysis shows that PFS comorbidity with birch and oak allergy existed in about one third of the subjects studied.
- However there is no statistically significant difference between PFS-positive subjects and PFS-negative subjects with regards to the severity of allergy symptoms evoked by birch pollen exposure in an EEC.
- The EEC allowed for the exposure of subjects to a steady levels of allergen in a controlled temperature and humidity environment ensuring consistency of data obtained.

References

(1) Skypala IJ, Calderon MA, Leeds AR, Emery P, Till SJ, Durham SR. Development and validation of a structured questionnaire for the diagnosis of Oral Allergy Syndrome in subjects with seasonal allergic rhinitis during the UK birch pollen season.

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