The Phenotypes of Allergic Asthma: Does In-vitro Allergy Testing Predict Poor Responsiveness

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Introduction

Allergy and asthma are often diagnosed concomitantly. Patients with both diagnosis might need to have a more targeted approach to reduce the symptomatic burden and severity of the disease.
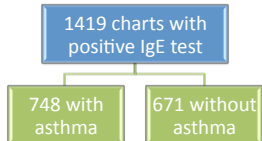
Aim

Explore the relationship between specific allergen sensitivity with asthma diagnosis and severity of asthma.

Hypothesis

Patients who tested positive to a higher allergy class and to/or more allergens, will be more likely to have severe asthma

Methods

Retrospective review

1419 charts with positive IgE test

748 with asthma — 671 without asthma

A logistic regression was used to analyze the likelihood of asthma diagnosis, severe asthma diagnosis, and allergic diagnoses.
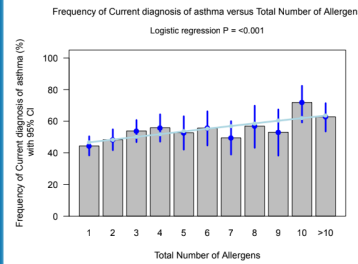
Data points analyzed

- Demographics
- COPD status
- Clinic and ED visits
- Allergies
- Asthma treatment
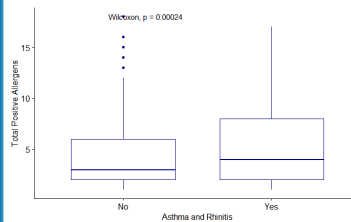- Allergic diagnoses

Measures used for severity

- Number of ED visits
- Number of hospitalizations
- Number and frequency of medications

Results

The likelihood of having a diagnosis of asthma when positive to one allergen is 45% [95% CI 38.4 – 50.5], this likelihood increases with the number of allergens (>10) to 63% [95% CI 53.6 – 71.4].
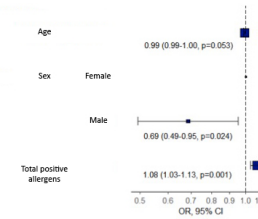

Frequency of Current diagnosis of asthma versus Total Number of Allergens
Logistic regression P = <0.001

If we take in account only patients with an additional diagnosis of allergic rhinitis, the likelihood increases to 69%

Wilcoxon, p = 0.00024

House dust, cat, dog and Cladosporium herbarum allergens show a relation with increased severity of asthma. The amount and severity of asthma cases also increases with a higher allergy class in these allergens

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The odds of asthma and rhinitis increases in females and by the increasing in the number of antigens

ASTHMA vs RHINITIS: OR (95% CI, p-value)

Asthma And Rhinitis	No	Yes	OR (univariable)	OR (multivariable)
age Mean (SD)	31.8 (23.1)	28.6 (21.5)	0.99 (0.99-1.00 p=0.064)	0.99 (0.99-1.00p=0.053)
Sex				
Female	104 (28.7)	258 (71.3)	-	-
Male	129 (33.5)	256 (66.5)	0.80 (0.59-1.09 p=0.159)	0.69 (0.49-0.95 p=0.024)
Total Positive Allergens Mean (SD)	4.4 (3.6)	5.4 (3.9)	1.07 (1.03-1.12 p=0.001)	1.08 (1.03-1.13 p=0.001)

Conclusion

- House dust, cat, dog or Cladosporidium herbarum are associated with increased asthma severity.

- Concomitant allergic rhinitis increases these risks

- Risk of developing asthma and having more severe asthma increases with a higher allergy class response

- There is no strong correlation between the number of allergens and asthma unless one of the previously mentioned is positive.

Even though a focused specific phenotype could not be identified, these data show clear trends that suggest that female patients with allergies to house dust, cat, dog or Cladosporidium herbarum, with concomitant allergic rhinitis and those with higher class IgE response will potentially develop more complex or severe asthma cases. This may allow for more personalized preventative care.