Clinical Pearls in Allergy and Immunology

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Three Topics
(and an intermission!)

1. Allergies to animals
2. Food allergy and intolerance

*Intermission*
(Cool Immunology Stuff)

3. Hygiene hypothesis
Topic 1

Allergies to Animals
(Focus on Dogs)

Images: Wikipedia dogs
Which dog is the least likely to trigger a severe allergic reaction?

A. Peruvian *Hairless* Dog
B. Chihuahua
C. St. Bernard
D. Labradoodle
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B. Chihuahua  
C. St. Bernard  
D. Labradoodle  
*E. None of the above*

Dog Allergy

The allergens are proteins found in the  
- epithelial cells  
- saliva  
- urine  

*Each animal is different!*  
*Each human is different!*
What can a person do to minimize dog allergen in the home?

Maintain one animal free zone (bedroom)
Ensure a healthy diet for your dog
Bathe the dog (once a week?)
Use a high quality HEPA air filter
Protect your furniture and car seats
Why do some people have symptoms around dogs and cats even though they have negative allergy skin tests to these animals?

They might be allergic to dust mites!

Chronic or “Perennial” Symptoms

- Allergic rhinitis (“colds”)
- Asthma (“bronchitis”)
- Recurrent sinusitis
- Allergic conjunctivitis
- Atopic dermatitis
What to know about dust mite allergy

Symptoms can occur *any time of the year* in the Bay Area, and locations with constant humidity. Common treatments for allergic rhinitis can help. Watch out for the development of *asthma* in adulthood!

**Recommendations:**
- Learn about and undertake aggressive *environmental preventive measures* in the home.
- Consider *allergen immunotherapy* for refractory cases.

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Key Points

- Dog allergy reactions are induced by proteins that exist in skin or saliva.
- There is no such thing as an “allergy-free” dog; a given individual might be very allergic to one dog and fine around another.
- Allergy testing can help distinguish whether a person is allergic to dogs, or whether the reaction is due to dust mite or other allergen.
A 32 year old woman presents with concern about food allergy. For the past three years she has noted increasing symptoms of itching, possible swelling and irritation in the mouth and throat upon eating certain foods, including apples, nectarines and plums. She asks whether food allergy testing is needed.
PMH:
– Generally healthy
– Infant eczema that resolved by age 5
– s/p appendectomy age 16
– Springtime hay fever symptoms including itchy, watery eyes, nasal congestion and drainage; occasional sinusitis with URIs

Meds:
Oral contraceptives
Calcium
PRN ibuprofen for headaches and dysmenorrhea

Drug allergies: None known

FH:
Father with HTN; mother with hypothyroidism, eczema
One brother with exercise induced asthma

SH:
Married, no children. Works as an attorney; no significant avocational exposures; non-smoker

ROS:
Occasional generalized headaches
Physical exam:
Remarkable only for slight conjunctival injection and moderate edema of the nasal mucosa

What is the cause of her problems with food?

A. Food allergy
B. Pollen-Food syndrome
C. Ibuprofen sensitivity
D. Irritation from chemical constituents of the food
What is the cause of her problems with food?

A. Food allergy
B. Pollen-Food syndrome
C. Ibuprofen sensitivity
D. Irritation from chemical constituents of the food

Adverse Food Reactions

- Non-Immunologic
- Immunologic
**Adverse Food Reactions**

### Non-immunologic

<table>
<thead>
<tr>
<th>Toxic/Pharmacologic</th>
<th>Non-Toxic/Intolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial food poisoning</td>
<td>Lactase deficiency</td>
</tr>
<tr>
<td>Heavy metal poisoning</td>
<td>Galactosemia</td>
</tr>
<tr>
<td>Scombroid fish poisoning</td>
<td>Pancreatic insufficiency</td>
</tr>
<tr>
<td>Caffeine</td>
<td>Gallbladder / liver disease</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Hiatal hernia</td>
</tr>
<tr>
<td>Histamine</td>
<td>Gustatory rhinitis</td>
</tr>
</tbody>
</table>

Adapted from
Sicherer/Sampson
JACI 2006; 117:S470-475

### Immunologic

#### IgE-Mediated (most common)

- Systemic (Anaphylaxis)
- Oral Allergy Syndrome
- Immediate gastrointestinal allergy
- Asthma/rhinitis
- Urticaria
- Morbilliform rashes and flushing
- Contact urticaria

- Eosinophilic esophagitis
- Eosinophilic gastritis
- Eosinophilic gastroenteritis
- Atopic dermatitis

#### Non-IgE Mediated

- Protein-Induced Enterocolitis
- Protein-Induced Enteropathy
- Eosinophilic proctitis
- Dermatitis herpetiformis
- Contact dermatitis

Pollen-Food Syndrome or Oral Allergy Syndrome

- Clinical features: rapid onset oral pruritus, rarely progressive
- Epidemiology: prior sensitization to pollens
- Key foods: raw fruits and vegetables
- Allergens: proteins that are heat labile
- Cause: cross reactive proteins pollen/food

Birch: Apple, carrot, celery, cherry, pear, hazelnut
Ragweed: Banana, cucumber, melons
Grass: Melon, tomato, orange
Mugwort: Melon, apple, peach, cherry

Adapted from AAAAI Food Allergy Teaching Slide

The diagnosis of Pollen-Food Syndrome can be made easily by asking the right question:

*Can you eat these apples baked into a pie?*

“Yes” Pollen-Food Syndrome

“No” Higher risk of major food allergic reactions
Why is this important?

Pollen-Food Syndrome is generally just annoying

*True food allergy can kill!*

If in doubt, prescribe epinephrine and consider referral to an Allergy/Immunology specialist

One more thing…

Serum IgG testing

Serum IgG testing for food allergy is

A. essentially irrelevant
B. specific but not sensitive
C. equivalent to prick skin testing
D. useful for eczema but not asthma
Serum IgG testing

Serum IgG testing for food allergy is

A. essentially irrelevant
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**Key Point**

IgG food testing is not helpful to define meaningful food allergies

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**Epinephrine Prescription**

Dr. Gundling’s demonstration video:
[http://www.youtube.com/watch?v=i6K2_kVmr3E&feature=g-hist](http://www.youtube.com/watch?v=i6K2_kVmr3E&feature=g-hist)

**Example:** Rx
Epinephrine auto injector
(adult) or (child) #2

Use as directed
2 refills

Image: AAAAI Food Allergy Teachings Slides
Intermission!

Cool Immunology Stuff

Neutrophil behavior most closely resembles the behavior of which superhero?

A. Batman  
B. Superman  
C. Spiderman  
D. Mr. Incredible
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A young woman who has asthma and atopic dermatitis is pregnant, and asks about whether her children will also suffer from atopic disease.

A discussion ensues about the genetics of these conditions, and the patient rightly wonders whether environmental exposures are important.
Which of the following early exposures is most associated with the prevention of atopic disease (atopic dermatitis, food allergy, allergic rhinitis, asthma)?

A. Barn animals
B. An older brother
C. A household dog
D. Dust mites in the pillow
Early exposure to barn animals is strongly associated with less atopy

Exposure to pets from infancy might also be helpful, as are older siblings

Exposure to dust mites is associated with increased atopic conditions


Farming, Bavarian Style

Courtesy of Erica von Mutius
Asthma Prevalence in the USA

Age **5-14**
- Male: 12%
- Female: 9%

Age **35-64**
- Male: 5%
- Female: 11%

Prevention of atopic conditions

**Clear:**
- Infants should be breast fed
- Early exposure to animals (especially barn animals) and older siblings is preventative
- Allergen immunotherapy can prevent the development of new sensitization and asthma

**Unclear:**
- What the pregnant mother should eat or avoid
- What the lactating mother should eat or avoid
- Whether an infant should be exposed to small amounts of common food allergens, or completely avoid common allergens
Summary of Today’s Clinical Pearls

Dog allergy: be skeptical about claims of “hypoallergenic”

Oral allergy syndrome (“food pollenosis”) can be diagnosed with one simple question.

*Prescribe and demonstrate the appropriate use of epinephrine!*

Spiderman behaves like neutrophils!

Dirt is GOOD for you!