Allergy and Immunology

Pearls for Clinical Practice

2017

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Nothing to declare

No discussion of non-FDA approved medication use
Adverse Drug Reactions
Intermission (with 2 Cool Immunology videos)!
Hygiene hypothesis update

News flash

“Adverse drug reaction” (ADR) = any unwanted reaction to a medication

“Drug allergy” = ADR that results from a specific immunologic response to a medication
The true incidence of Drug Allergy is unknown:

Estimated...
1-2% of hospital admissions
3-5% of hospitalized patients

Variety of immunologic reactions...
Anaphylaxis
Serum sickness
SJS/TEN
Others

Perioperative Anaphylaxis

Reactions can be severe or fatal

Exposure to many agents occurs during a short time period:
— Antibiotics
— Neuromuscular blocking agents
— Propofol
— Latex
— Chlorhexidine
— Dyes
— Opioids
— Blood transfusions
— Benzodiazepines
— Others
Perioperative Anaphylaxis

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The incidence of perioperative anaphylaxis is the same in boys and girls but more common in women than men.
“3/4 of anaphylactic reactions to neuromuscular blocking agents occur in women, ..... 

suggesting that cross-reactions with ammonium compounds in makeup and other personal care products could be responsible.”

Anaphylaxis Practice Parameters

Perioperative Anaphylaxis

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– Others
Commercial products that contain chlorhexidine (to name a few):

- Antiseptic mouthwashes
- Antiseptic sore throat lozenges and sprays
- Antiseptic toothpastes
- Topical eczema creams
- Acne creams
- Antiseptic powders such as athletes foot powder
- Antiseptic creams
- Antiseptic wipes

More chlorhexidine containing products

- Antiseptic dressings
- Skin washes/cleansers
- Topical disinfectants
- Bladder washouts
- Eye drops
- Contact lens solution
- Anesthetic gels for catheterization
- Some creams and sprays (such as nasal sprays) include chlorhexidine as a preservative
- Some sunscreens
- Central venous catheters
Clinical Pearls

If your patient develops a rash upon exposure to chlorhexidine, consider avoiding its use during the perioperative period.

****Chlorhexidine is embedded in some central line catheters****

Clinical Pearls

A serum tryptase level can help distinguish anaphylaxis from other causes of similar symptoms:
- within 1-2 hours of the event, and
- at baseline (a couple of weeks later ok)

*Elevated acute* tryptase levels supports mast cell degranulation as a proximate cause of the event
*Elevated baseline* tryptase supports an underlying mast cell activation disorder
A patient with a previous allergic reaction to which agent is most likely to experience a drug allergic reaction to furosemide?

A. Acetazolamide  
B. Atenolol  
C. Penicillin  
D. Trimethoprim-sulfamethoxazole

Reactions to sulfonamide non-antibiotics are likely due to predisposition to allergic reactions, not due to cross-reactivity with sulfonamide antibiotics!

On the sulfonamide molecule it is the arylamine component that is most allergenic, hence the vast majority of patients who react to arylamine sulfonamides will not react to non-arylamine sulfonamides.
### Partial list of sulfonamide medications

<table>
<thead>
<tr>
<th>Arylamine Sulfonamides</th>
<th>Non-arylamine Sulfonamides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfamethoxazole</td>
<td>Carbonic anhydrase inhibitors</td>
</tr>
<tr>
<td>Sulfadiazine</td>
<td>Sulfonylureas</td>
</tr>
<tr>
<td>Sulfacetamide</td>
<td>Loop diuretics</td>
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<tr>
<td>Sulfasalazine</td>
<td>Thiazide diuretics</td>
</tr>
<tr>
<td><strong>Sulfonamide antiretrovirals</strong></td>
<td><strong>Anti-inflammatory</strong></td>
</tr>
<tr>
<td>Amprenavir</td>
<td>Others</td>
</tr>
<tr>
<td>Fosampranavir</td>
<td></td>
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</tbody>
</table>

From the furosemide package insert, noted in 2017:
“patients allergic to sulfonamides may also be allergic to furosemide.”

**Updated recommendations:**
“The weight of evidence suggests that withholding non-antibacterial sulfonamides from patients with prior reactions to antibacterial sulfonamides or other non-antibacterial sulfonamides is not clinically justified.”

N Engl J Med 349:17  
Am J Health-Syst Pharm 70:1483-94
The Drug Allergy Practice Parameters from the AAAAI state:

“There is no evidence to suggest allergic cross-reactivity between sulfonamide antibiotics and nonantibiotic sulfonamides.”

AAAAI.org Drug Allergy: An Updated Practice Parameter

Clinical Pearls

The term “sulfa” allergy should be dropped!

- Endeavor to determine and report the exact medication to which a reaction occurred.
- When that information is not available, inquire as to the condition that was being treated, and document the information.
Adverse Drug Reactions

Intermission (with 2 Cool Immunology videos)!

Hygiene hypothesis update

News flash

How can one “boost” the immune system?

Everything Grandma told you is true....

Get a good night’s sleep
Eat a variety of foods, including fruits and vegetables
Moderate (not severe or couch potato type) exercise
Laugh with your friends
Listen to some good music
Adverse Drug Reactions
Intermission (with 2 Cool Immunology videos)!

Hygiene hypothesis update

News flash

Early life exposure to which of the following is most associated with the prevention of atopic disease (atopic dermatitis, food allergy, allergic rhinitis, asthma)?

A. A household dog
B. An older brother
C. Barn animals
D. Dust mites in the pillow
Answer: Barn animals

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
Images: Wikipedia dogs

Image by K. Gundling
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

Gathering data:
- Influence of food/microbiome of the gut and airways
- Role of early exposures to pollution, infections, medications
- Whether/when an “at risk” infant should be exposed to small amounts of common food allergens (New guidelines in 2017 for introduction of peanuts to infants)
Adverse Drug Reactions

Intermission (with Cool Immunology videos)!

Hygiene hypothesis update

*News flash*

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*News Flash*

Dust mite sublingual *tablets* have just been approved to treat allergic respiratory disease!

*Consider this type of immunotherapy for patients who:*
- have year round allergy symptoms
- who have a limited number of allergic triggers
- who are tired of taking medication
- who don’t have time to dedicate 3-5 years to allergy shots
Summary of Key Points

- Multiple agents can cause severe anaphylaxis in the perioperative period
- “Sulfa allergy” is a term that should be dropped
- Immune cells at work are truly awe inspiring
- Early life exposures play a key role in training a healthy immune system
- For those people who already have allergy to dust mites, immunotherapy tablets are a new option to retrain the immune system