EQUINE ALLERGIES

Hypersensitivity and what to do about it

Katy Brandes, DVM
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What are "Allergies", Exactly?

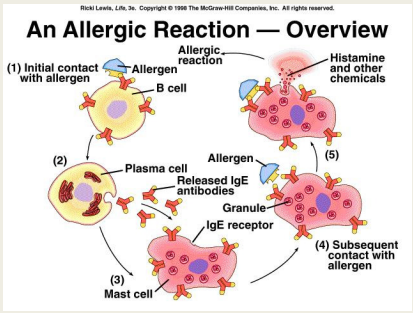
- Immune system: large, specialized, complicated group of organs and cells
  - *Function: determine what is safe for the body vs what is not*
    - Example – identify a kidney cell as "normal", identify a bacterial cell as "abnormal"
  - *Allergic reaction: when the body mistakenly decides that something harmless (aka pollen) in the environment is something dangerous*
    - Mild example: itching, small hives that come and go
    - Extreme example: peanut allergy causing death
  - *The term "hypersensitivity" is often used in place of "allergy"*
- Four types of Hypersensitivities: all have different ways of causing a reaction
  - *Type I – typical allergies (food sensitivity, seasonal allergies, hay fever, anaphylaxis)*
  - *Type II – antibody reactions (autoimmune anemia, transfusion reactions, NI)*
  - *Type III – immune complex (rheumatoid arthritis, lupus)*
  - *Type IV – delayed type (diabetes type 1, MS, contact dermatitis)*

The Science Behind an Allergic Reaction

- What happens in a common allergic reaction?

(aka Type I)

1. *An allergen comes into contact with an immune cell (B cell) in the body*
2. *B cell "over-reacts", and creates antibodies against the allergen*
3. *Mast cells pick up antibodies and display them on their cell walls*
4. *Allergen attaches to antibodies (which are attached to the mast cells)*
5. *Mast cell releases histamine/other chemicals*
6. *Histamine causes symptoms*



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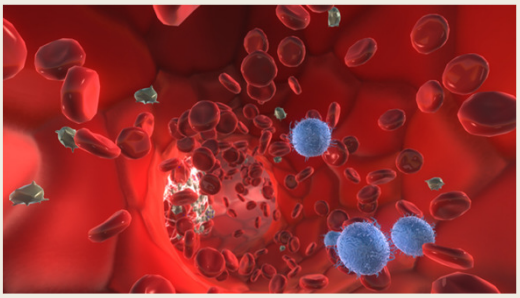
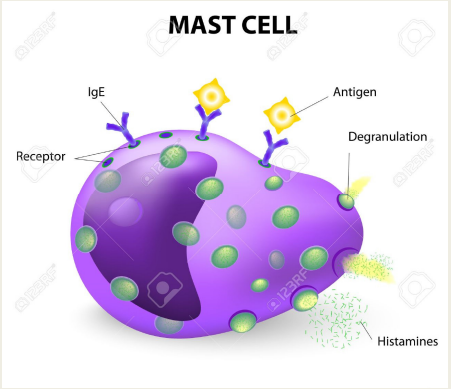
The Science Behind an Allergic Reaction

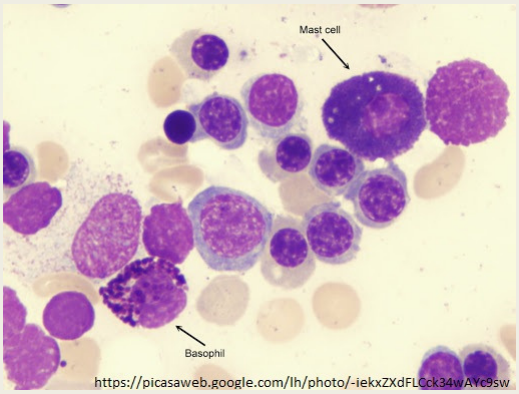
- What happens in a common allergic reaction?
  2. *B cell "over-reacts", and creates antibodies (IgE) against the allergen*
     - B cell identifies allergen/pollen as "foreign" and tells the body that it could be dangerous
       - *Note: B cells create antibodies to everything they "see"!*



The Science Behind an Allergic Reaction

- What happens in a common allergic reaction?
  3. *Mast cells pick up antibodies (IgE) and "show them off" to other white blood cells*
     - These cells are located around blood vessels, in skin, around small airways and others





The Science Behind an Allergic Reaction

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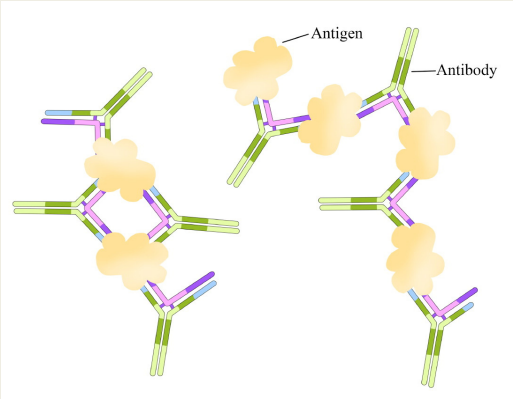
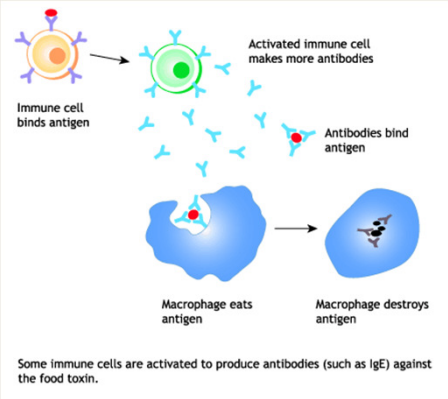
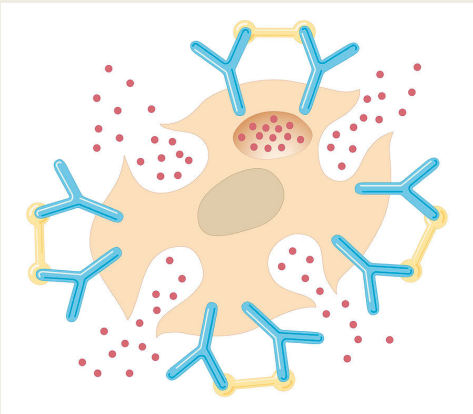




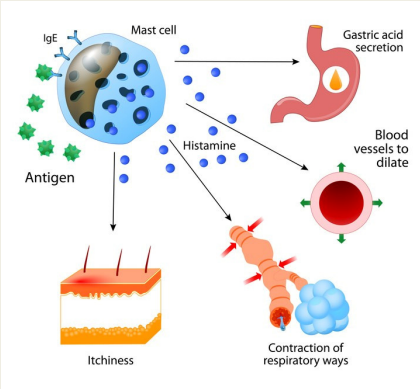
The Science Behind an Allergic Reaction

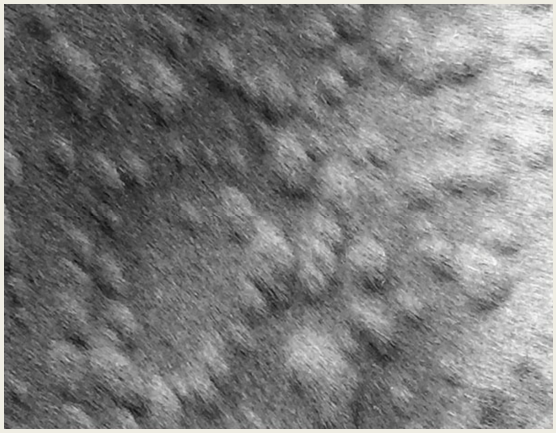
- What happens in a common allergic reaction?
  5. *Mast cell releases histamine/other chemicals*



The Science Behind an Allergic Reaction

- What happens in a common allergic reaction?
  6. *Histamine causes symptoms*





This is all very streamlined, of course…

- The immune system is an extremely complex thing
  - *We often don't know all the components*
  - *Many different cell types involved: B cells, T cells (and all subset T cells – Thelper, cytotoxic T cells, memory helper), antigen-presenting cells/mast cells, macrophages, cytokines, the buzzwords keep coming*
- Main point: hypersensitivities affect every aspect of "telecommunications"
  - *Each animal (humans included) all function a little differently*
    - AT&T vs Verizon

Common Equine Allergies

- Insect hypersensitivity
- Contact hypersensitivity
- Airborne hypersensitivity – dust/mold/pollen

Less common problems

- Food hypersensitivity
- Medication/dewormer sensitivity
- Vaccine reactions
- Anaphylaxis

Insect Hypersensitivity

- Allergic to insect saliva, not a reaction the bite itself
  - *Most common: Midges (culicoides spp) – we are lucky to have few Culicoides in SoCal*
- Any other biting/flying insect can cause reactions
  - *Mosquitos, horseflies/deerflies, blackflies, mites, fleas…*
- Common reactions:
  - *Itching ("sweet itch" is the most severe form), hair loss*
  - *Skin scabbing, flaking, crusting*
  - *Hives (urticaria)*
    - Usually mild to moderate; can cut off airway if severe
  - *Summer sores*
- Most effective treatments
  - *Fly control, fly control, fly control*
    - Altering turnout times, fly mask/sheets, fly spray…

Contact Hypersensitivity

- Anything exposed to the horse's skin has the potential to cause an allergy!
  - *Neoprene (saddle pads, boots), wool/lanolin*
  - *Topicals: shampoo, fly spray, essential oils, rubber bits*
  - *Oral/topical medications/dewormer (different from systemic reactions)*

- Common reactions:
  - *Itching, hair loss*
  - *Hives*
  - *Chemical burn*

- Most effective treatment
  - *Find the cause and eliminate*

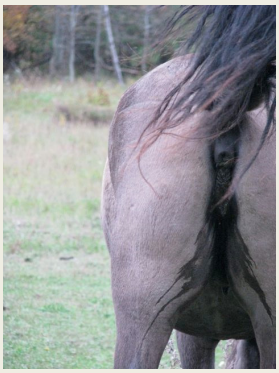
Airborne Hypersensitivity

- The most difficult kind of allergy – hard to pin down the cause!
  - *Dust, pollen, molds are the most common causes*

- Common reactions: usually one or the other
  - *Skin reaction – itching, hives*
  - *Respiratory reaction – RAO/"heaves" (chronic cough, increased respiration)*

- Most effective treatment
  - *Environmental change: minimize exposure*
    - Impossible to eliminate environment, but can often improve
  - *Assorted veterinary therapies (steroids, allergy testing)*

Food/Medication Sensitivity



- Horses can be sensitive to certain foods and medicines, like people
  - *Appears to be much less common in horses than in people*
- Common reactions:
  - *Medications:*
    - Diarrhea, sun sensitivity, skin irritation/itching/hives, anaphylaxis
  - *Food:*
    - Gastrointestinal – diarrhea, 'fecal water syndrome', inconsistent skin allergy symptoms
- Most effective treatment
  - *Process of elimination*

Vaccine Reactions

- Vaccines are designed to elicit an immune response
  - *Most horses/people react to the 'adjuvant' (vaccine carrier liquid), not to the diseases themselves*
  - *Undergo extensive testing in the lab and in the field to ensure that the majority of horses do not suffer anything more than mild responses*
- Common reactions:
  - *Hives*
  - *Low grade fever*
  - *Local irritation (neck soreness, small neck bumps at injection site)*
    - Not an allergic reaction
- Uncommon reactions:
  - *Severe hives/swelling*
  - *Anaphylaxis*

Anaphylaxis – Uncommon

- Anaphylaxis: An overwhelming allergic response causing **massive** release of histamine and other substances
  - *Can be life threatening*
  - *Often a combination of previous exposure and amount of allergen*
    - Example: Peanut allergy, shellfish allergy
- Signs of anaphylaxis:
  - *Rapid swelling, severe hives/skin involvement, respiratory discomfort, colic signs, recumbency (down), death*
- Treatment
  - *Corticosteroids*
  - *Epinephrine (Epi-Pen/adrenaline) if truly severe*

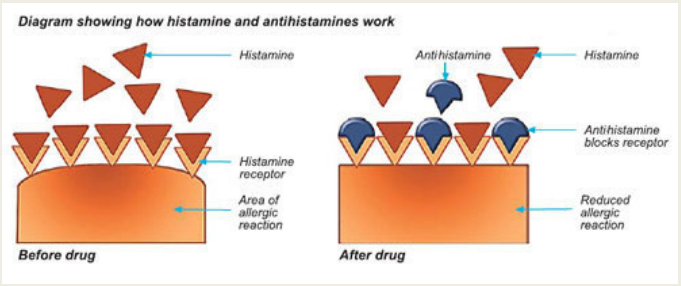
First-Line Treatments

- Environmental control: most effective and most important
  - *Can always provide short term options, but hard to make long term changes without removing the initial cause*
    - Fly mask, fly sheets, slinky/sleezy, fly boots, dietary trials, feed through fly control
    - Fly predators, good manure management
- Medications
  - *Antihistamines*
    - Good second line of defense: help relieve the itch with fewer/milder side effects
  - *Steroids*
    - Most effective for short term/more severe reactions
    - Do carry some risk of side effects
  - *Combination treatments*
    - Ointments, sprays, shampoos…

Common Medications

- **Antihistamines**
  - *Benadryl: diphehydramine*
  - *Zyrtec: cetirizine*
  - *Hydroxyzine - RX*
  - *Tripelenamine - RX*

Be careful with over-the-counter medications – they often contain other meds that may be harmful



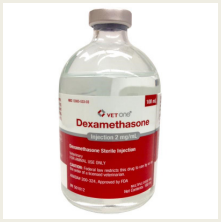
Topical Treatments

- Ointments
- Shampoos
- Sprays

Often contain one or a combination of:

- Antiseptic (chlorhexidine)
- Anti-fungal (ketoconazole/similar)
- Topical anesthetic (pramoxine/-caine)
- Steroid (hydrocortisone)

Common Medications

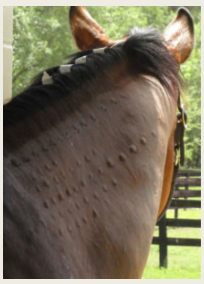


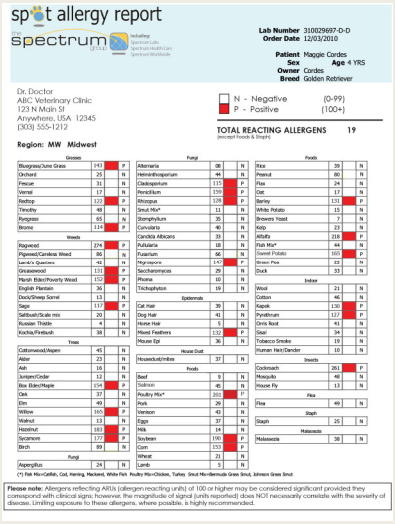
- **Corticosteroids** (not anabolic steroids)
  - *Dexamethasone*
  - *Prednisolone (not prednisone)*
  - *Others: triamcinolone/vetalog,*
- How they work
  - Systemic (whole-body) anti-inflammatory effect
    - Switches off "inflammatory" genes (and therefore stops production of inflammatory factors) involved in multiple different reactions
    - Very widely used for a variety of different problems (human and animal)
      - Species-specific!
        - What may work for a human may not work for a horse
        - Horse may need vastly different concentration than a dog or a human
  - Side effects are possible

What if this keeps happening?

- Allergy testing – serum vs skin
  - *Serum: blood draw – tests for IgE (antibody common in allergy reactions)*
  - *Skin: usually performed by a specialist*

  Treatment: hyposensitization shots
    - Small injections given under the skin at a regular interval
- Supplementation – mixed reviews
  - *EquiShield SA*
  - *Platinum Skin and Allergy*
- Novel or additional therapies
  - *Apoquel*




spt allergy report
spectrum

Lab Number 310029697-D-D
Order Date 12/03/2010
Patient Maggie Cordes
Sex
Age 4 YRS
Owner Cordes
Breed Golden Retriever

Dr. Doctor
ABC Veterinary Clinic
123 N Main St
Anywhere, USA 12345
(303) 555-1212

N - Negative (0-99)
P - Positive (100+)

TOTAL REACTING ALLERGENS 19

Region: MW Midwest

Please note: Allergens reflecting ARUs (allergen reacting units) of 100 or higher may be considered significant provided they correspond with clinical signs; however, the magnitude of signal (units reported) does NOT necessarily correlate with the severity of illnesses. Limiting exposure to these allergens, where possible, is highly recommended.

Questions?