BELGIAN EQUINE
PRACTITIONERS SOCIETY
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INTRODUCTION

There is a variety of equine allergic hypersensitivity conditions: insect hypersensitivity, food allergy, atopic dermatitis, topical and systemic drug reactions. Allergic hypersensitivity reactions can present clinically with pruritus and/or hives. Generalized skin eruptions may be present with papules, scales and crusting. Secondary bacterial infections are common and can exacerbate the pruritus.

INSECT HYPERSENSITIVITY

Insect hypersensitivity is the most common cause of equine pruritus. The disease is most commonly caused by hypersensitivity to salivary antigens administered by the biting insect. The tendency to develop insect hypersensitivity seems to be multifactorial (genes, MHC complex, geography). Insect hypersensitivity reactions may be 35% inherited. Many horses start to develop signs at a young age (2-4 yr).

Insect hypersensitivity is generally a seasonal highly pruritic (somewhat steroid unresponsive depending on severity) disease. Primary skin lesions are papules and wheals seen in a distribution pattern that depends on the feeding habits of the insects involved (cfr table 1). Secondary lesions result from self trauma and are alopecia, crusting, hypopigmentation, excoriations. Typical are the “buzzed mane” and “rat tail” appearance seen in Culicoides hypersensitivity.

ATOPY

Atopy (atopic dermatitis, atopic disease) is best described as a multifactorial disease in which genetically predisposed animals exhibit a combination of IgE-mediated immediate and late phase reactions to environmental antigens (pollens of grasses, weeds, trees, molds and dust). Immunologic abnormalities, antigenic stimuli, altered physiologic and pharmacologic reactions and a genetic predisposition all play a role in the pathogenesis. A median age of onset of 5-6, 5 yr has been reported. Males were over represented in one study.
Many of the affected horses will present with similar findings as those seen with insect bite hypersensitivity: pruritus with secondary lesions of alopecia, excoriations, lichenification and hyperpigmentation may be present on the face, ears, ventrum and legs. In fact, both insect bite hypersensitivity and atopic dermatitis can coexist in a horse. Horses may develop secondary pyoderma, characterized by excessive scaling, small epidermal collarettes or encrusted papules. Chronic recurrent urticaria, which may or may not be pruritic, and allergic based RAO, similar to asthma in humans and cats may present with or without the pruritic form.

**Food intolerance**

There is much debate whether this disease exists in horses at all. Food intolerance in the horse is an allergic or idiosyncratic reaction to dietary grains, food additives or dietary supplements. Specific incriminated food groups that induce pruritus in the horse are wheat, oats, concentrates, barley, bran, alfalfa and feed supplements. Food allergy should be considered in horses demonstrating NON-seasonal signs of pruritus or symptoms of urticaria. Pruritus limited to the base of the tail should make one concerned with food hypersensitivity. Concurrent gastrointestinal signs in the form of diarrhea or soft stools have been reported.

**Contact allergies**

Contact allergies develop with long term or intermittent exposure to the offending allergen (plants, bedding, topical agents and tack). Pruritus is variable. Papules, vesicles, and erythema with alopecia and lichenification can be seen. The location of these lesions may raise the suspicion of a contact allergy.

**Diagnosis**

The diagnosis of allergic skin disorders relies heavily on the history and physical findings. The documentation of an “itch profile” is always important (cf table 2). Exclusion of other causes of pruritus must be performed before establishing the diagnosis of atopic dermatitis. Other tools that can aid in the diagnosis of allergic skin disorders include dermatopathology, allergy testing, therapeutic trials (strict ectoparasite control) and elimination diets.

**Dermatopathology**

Many allergic horses will exhibit mixed eosinophilic perivascular infiltrates. The histopathologic findings are not pathognomonic and are seen in atopic dermatitis, insect-bite hypersensitivity, food allergy, contact dermatitis and cutaneous adverse drug reactions. Dermatopathology can be useful to rule out other skin diseases and diagnose a secondary bacterial infection.
Allergy testing

Allergy testing is NOT used to make a diagnosis of atopic dermatitis !!! It is a test that can be used to identify which allergens should be avoided or included in an allergen specific immunotherapy (ASIT) protocol. Demonstration of sensitivity to allergens, by intradermal testing or IgE serology does not necessarily mean that the horse is allergic or will become allergic to those allergens. Positive reactions most always be correlated to the patient’s pruritus profile.

- **Intradermal testing (IDT)**
  Intradermal testing is the preferred method for identifying allergens suitable for avoidance and/or ASIT. Skin testing assesses tissue fixed IgE and the entire inflammatory cascade. Mast cells can augment B cell production of antigen specific IgE in tissues without systemic (blood) levels being significantly increased. This increase in antigen specific IgE in tissue can then be identified by IDT but not by serum IgE testing. Skin testing also has it’s problems. False positive and false negative reactions can occur. It requires sedation and shaving and withdrawal of antihistamines and corticosteroids (4 weeks) before the IDT.
  The best site for testing is the lateral cervical region above the jugular furrow. The site should be clipped and ink marks are placed where the intradermal injections will be given. Antigen selection is based on the geographic region. Reactions should be evaluated at 15-30 min and 45 min. If possible also at 24 and 48 hours. Reactions are subjectively graded between 0 and 4. Grading is based upon size comparisons to the positive (histamine 1:100,000 dilution) and negative control (saline).

- **Serologic allergy tests**
  There is a lot of controversy associated with in vitro testing. To date the value of these tests and ASIT performed based on the test results have not been impressive in horses.

Elimination diets

There is no accurate in vitro or in vivo test for food allergies. The only way to diagnose food intolerance or food hypersensitivity is to do a food trial. The duration of a food trial in the horse should be 4-6 weeks. During those weeks the patient should be restricted from all food supplements, additives and drugs and should be fed a foreign hay source. This should preferably be a hay of a single species of grass. At the end of the dietary trial the horse should be reintroduced to the previous diet and/or supplements. Generally adding one item a week is recommended to determine which food group or supplement is responsible.
Treatment

Combinations of allergies are more and more recognized. It is therefore important to keep the concepts of “allergic threshold” and “summation of effect” into account. Regardless of the therapeutic protocol selected for the horse, the owner must be educated regarding the chronicity of equine allergies.

- **Environmental control**
  
  Avoidance or reduced allergen exposure is the best treatment for all allergic forms however many times it is impractical. Reducing exposure may not necessarily be enough for complete control of pruritus, but may aid along with other treatments.
  
  - Move from the current environment
  - Minimize dust exposure in the barn
  - Control insects in the environment
  - Use dietary trials

- **Topical control**
  
  - Strict ectoparasite and fly control (permethrin based spray)
  - Topical steroids

- **Allergen specific immunotherapy (ASIT)**
  
  ASIT is a useful long term treatment alternative in equine veterinary dermatology. It is indicated in animals in which avoidance of antigens is impossible, signs are present for more than 4-6 months a year and pruritic drugs are unsatisfactory or contraindicated. Beneficial responses can be seen in 2-4 months, but ASIT should be tried for at least 12 months to appreciate the maximum effect. Several studies show a beneficial effect (good to excellent responses) in over 60% of the horses. Some of these studies show a better effect of ASIT when insects are not major allergens. When selecting allergens for inclusion in ASIT, it is important to correlate allergy test findings with likelihood of allergen exposure. Most horses require booster injections every 2 weeks. Antigen volume and shot interval adjustments need to be made on an individual basis. Adverse reactions are uncommon, with temporary (resolve in 1-2 days) swelling at the injection site being most common.

- **Antihistamines**
  
  Antihistamines block the action of histamine at receptor sites. They may also have antipruritic effects and reduce urticarial reactions by stabilizing mast cells. Antihistamins typically have fewer side effects than corticosteroids but are less effective. Hydroxyzine hydrochloride can be used at a dose of 1-1.5 mg/kg every 8 hours. This has been shown to be more effective in controlling urticaria than pruritus.
• **Corticosteroids**
  Corticosteroids are frequently used in equine allergic dermatitis but need to be used judiciously and in appropriate dosing and intervals as aggressive use may cause various adverse side effects including steroid hepatopathy, laminitis, iatrogenic hyperadrenocorticism.

Therapeutic dosages are not determined in many equine dermatoses and each case needs to be treated individually. Recommended dosages are merely guidelines to follow. Most induction periods range from 7-14 days followed by a tapering period of 2-5 weeks and a maintenance period of several months depending on the severity and seasonality.

<table>
<thead>
<tr>
<th>Induction</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prednisolone</td>
<td>0.5-1.5 mg/kg daily</td>
</tr>
<tr>
<td>Dexamethasone</td>
<td>0.02-0.1 mg/kg daily</td>
</tr>
</tbody>
</table>

• **Other treatment options**
  Methylsulfonylmethylene (MSM) can be used in conjunction with other anti-inflammatory agents for its antioxidant properties. Controlled studies are lacking, but one of the currently used doses is 10-12 gr/500kg twice daily and then taper to once daily.

**Table 1.** Ectoparasite information for insects that cause equine hypersensitivity reactions.

<table>
<thead>
<tr>
<th>Type of insect</th>
<th>Feeding location</th>
<th>Time of feeding</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culicoides spp</td>
<td>Depends on species</td>
<td>Sunrise and sunset</td>
<td>Standing water, decaying vegetation, manure</td>
</tr>
<tr>
<td></td>
<td>Dorsal (mane &amp; tail)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ventrum</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Both</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blackflies</td>
<td>Face, ears</td>
<td>Morning &amp; evening</td>
<td>Running water</td>
</tr>
<tr>
<td></td>
<td>Abdomen, groin,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medial forelegs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stable flies</td>
<td>Legs</td>
<td>Early morning, late evening</td>
<td>Manure</td>
</tr>
<tr>
<td></td>
<td>Abdomen</td>
<td></td>
<td>Decaying bedding</td>
</tr>
<tr>
<td>Horn flies</td>
<td>Focal midline (around the umbilicus)</td>
<td>Daytime</td>
<td>Cow manure</td>
</tr>
<tr>
<td>Mosquitoes</td>
<td>Lateral aspect of the body</td>
<td>Dusk Immediately after sunset</td>
<td>Water</td>
</tr>
</tbody>
</table>
Table 2. Pruritus profile

- Age of onset
- Scoring of the pruritus
- Distribution of the pruritus
- Timeline of the pruritus (seasonal or not, constantly increasing, waxing and waning)
- Respons to treatment

Selected references