Equine Allergy Therapy

Update on the Treatment of Environmental, Insect Bite Hypersensitivity, and Food Allergies

Rosanna Marsella, DVM, DACVD

KEYWORDS

• Atopic dermatitis • *Culicoides* hypersensitivity • Environmental allergies
• Food-induced dermatitis • Urticaria

KEY POINTS

- Allergies are extremely common in horses and may represent a diagnostic and therapeutic challenge for practitioners.
- As allergies are multifactorial and additive, it is important to identify and correct as many factors as possible to control pruritus and make the patient comfortable.
- *Culicoides* hypersensitivity is a common component in allergic horses, but despite significant advances in the understanding of the pathogenesis of the disease, the main treatment continues to be rigorous fly control and avoidance of insect bites.
- Environmental allergies are best addressed by early identification of the offending allergens and formulation of allergen-specific immunotherapy to decrease the need for rescue medications.
- Food allergy, diagnosed with a food trial followed by rechallenge, is best managed with food avoidance.

GENERAL CONCEPTS FOR THE MANAGEMENT OF ALLERGIC HORSES

Therapy of allergic diseases is closely linked to the diagnostic approach to the pruritic horse, as management of allergic cases requires a process of elimination of offending causes. Allergies are multifactorial and additive. Most patients have multiple allergies, and it is crucial to properly identify all the factors that contribute to the clinical signs in each patient in order to successfully control them. Many of these patients are atopic and therefore are prone to develop an allergic response to many different allergens ranging from pollens to insects, and sometimes also foods. As pruritus develops, self-trauma is common, and that frequently leads to secondary infections. Thus,

The author has nothing to disclose.
Department of Dermatology, University of Florida College of Medicine, PO Box 100126, Gainesville, FL 32610-0126, USA
E-mail address: marsella@ufl.edu

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management of these cases requires identification and correction of all factors playing a role in the level of pruritus. According to the theory of the pruritic threshold, an individual is able to tolerate a certain amount of pruritic stimuli without developing clinical signs. Once that threshold is exceeded, clinical signs ensue. Thus a large part of the management of these cases involves identifying that pruritic threshold and removing or correcting as many factors as possible in order to take the patient below the pruritic threshold (Fig. 1).

CULICOIDES HYPERSENSITIVITY

Although much progress has been made in the understanding of the pathogenesis of *Culicoides* hypersensitivity, the treatment for this condition is still unsatisfactory.[1] Management of *Culicoides* hypersensitivity can be summarized in 3 points:

1. Control the itch to prevent additional self-trauma.
2. Resolve secondary infections.
3. Prevent additional bites.

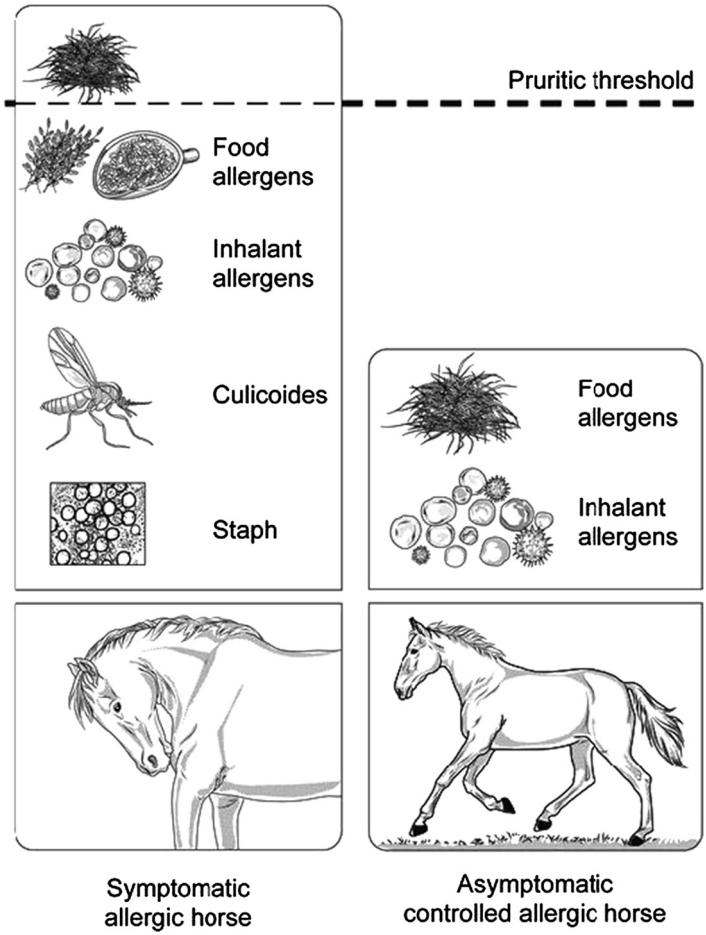

Fig. 1. The concept of pruritic threshold.

Control of the Itch

Control of the itch typically involves a combination of topical and systemic glucocorticoids depending on the severity of the clinical signs. It is always preferred to use topical therapy when possible to minimize the use of systemic glucocorticoids and decrease the risk for laminitis. Topical glucocorticoid therapy can be accomplished by using topical triamcinolone spray and a leave-on hydrocortisone conditioner. There are also a variety of glucocorticoid shampoos and lotions containing ingredients such as fluocinolone acetonide that can be used. When using shampoo therapy, it is recommended that the shampoo be left on the skin for 10 minutes before rinsing to maximize contact time and increase the efficacy of topical therapy. Lotions are particularly helpful for therapy of localized lesions such as the face and ears, which are not amenable to shampoo therapy. For more severe cases, prednisolone can be used systemically at an induction dose of 2 mg/kg every 24 hours for 3 to 10 days. Once the pruritus is controlled, this dose can be tapered to 0.5 mg/kg every 48 hours. Some horses may require dexamethasone (0.2 mg/kg every 24 hours), although this is not recommended for long-term management.

Antihistamines are another nonglucocorticoid alternative to decrease pruritus, although therapeutic success appears to be limited. Few published studies exist on the efficacy of antihistamines in horses with allergic disease. A recently published study reported no benefit with the use of cetirizine in horses with insect hypersensitivity.[2] Other antihistamines commonly prescribed include hydroxyzine (1–2 mg/kg every 8–12 hours by mouth) and chlorpheniramine (0.25–0.5 mg/kg every 12 hours by mouth). It is important to note that antihistamines seem to work best as a preventative before the beginning of allergy season and much less once the season has started. If needed, they can be combined with glucocorticoids. It is the clinical impression of the author that antihistamines appear to work best in combination with other allergy therapies and in patients with an environmental allergy rather than in horses that primarily suffer from *Culicoides* hypersensitivity.

Another treatment option to help decrease the need for glucocorticoids is the use of fatty acid supplementation, although efficacy is limited. A supplement containing sunflower oil, vitamins, amino acids, and peptides was tested in a controlled double-blinded clinical trial, but no significant differences in treatment-groups were noted when symptom severity was scored by the horse owners.[3] Flax seed has been used to decrease inflammation in allergic horses.[4] This supplement is well tolerated and may help to decrease clinical signs.

Resolve Secondary Infections

This second point in the management of *Culicoides* hypersensitivity requires a combination of topical antimicrobial therapy and, for more severe cases, systemic antibiotics. Topical antimicrobial therapy can be accomplished with shampoos, sprays, and conditioners. Examples of shampoos include chlorhexidine-, benzoyl peroxide-, and ethyl lactate-containing products. Benzoyl peroxide is effective in removing crusts, but it may dry and bleach the coat in some animals. Ethyl lactate is an effective antimicrobial that appears gentler and less drying than other antimicrobial products. Examples of antimicrobial sprays include oxychlorine-based products and 0.4% stannous fluoride, which has been demonstrated to be an effective treatment for staphylococcal infection in horses.[5] In terms of systemic antibiotic therapy, potentiated sulfonamides are a common empiric choice for staphylococcal infections. In chronic cases that have already had multiple courses of antibiotics, it may be helpful to submit a culture to test for antibiotic resistance and base the treatment recommendation on

these findings. The average case of bacterial folliculitis requires 3 weeks of oral antibiotics. One of the adverse effects of prolonged therapy with potentiated sulfonamides is colitis. Horses treated with this antibiotic will need to be monitored for diarrhea.

Prevent Additional Insect Bites

The third point in the management of *Culicoides* hypersensitive horses involves strategies to decrease the number of bites. This can be accomplished in a number of ways, ranging from the diligent daily use of insect repellents to stalling the affected horse in front of strong fans at times when are most active (dusk and dawn). To help minimize exposure to *Culicoides*, horses should be moved to paddocks further away from bodies of standing water where these gnats breed. Gnats do not fly a long distance from their breeding grounds and do not fly well against the wind.

In terms of insect repellents, many products are available on the market and are labeled as insect repellents. In reality, many of them are just insecticides and not true repellents. Preference should be given to products containing 2% or higher of permethrin in formulations that adhere to the coat and are not easily washed off by the rain. Many spot on formulations with 44% to 64% permethrin are available on the market for specific use in horses. At this high percentage, a good repellent activity is obtained. These products can be used on specific problem areas (pole, base of the tail, base of the neck) once weekly, while sprays with lower concentrations (2% permethrin) may be used to cover the rest of the body. Besides permethrin, other synthetic pyrethroids such as cypermethrin can be effective repellents. Regardless of the product used, frequent (in most cases daily) reapplication is key, because even the best product does not have a long residual efficacy when horses sweat or are in high-humidity climates. Fly masks and fly sheets may be used as long as they are changed frequently. Soiled coverings may predispose to secondary infections, especially if they trap moisture in the heat of the summer.

ATOPIC DERMATITIS

Environmental allergies are the second most common allergy seen in horses. Management of atopic dermatitis can be done both symptomatically, by suppressing the inflammation and the pruritus triggered by the allergic response, and by addressing the specific cause (ie, by identifying the responsible allergens and formulating an allergen-specific vaccine).

The symptomatic approach is typically needed in the short term to make the patient comfortable and minimize self-trauma. This approach relies on the use of a combination of topical and systemic therapies including antihistamines, essential fatty acids, pentoxifylline, and glucocorticoids. Mild cases may respond to a combination of antihistamines and essential fatty acids. This approach is aimed more at preventing or minimizing the severity of flare ups, rather than controlling acute, more severe flare ups, which may require more aggressive therapy with glucocorticoids. Pentoxifylline has been found to be beneficial in moderate cases of atopic dermatitis. This drug is typically well tolerated and is safe for long-term use. Occasionally sweats and irritability have been reported by owners. Pentoxifylline is commonly prescribed at the dose of 8 to 10 mg/kg every 8 to 12 hours.

The primary approach to environmental allergy control involves the identification of allergens that trigger the hypersensitivity reaction. Allergy testing is used to detect the presence of allergen-specific immunoglobulin E (IgE). It is important to note that allergy testing (either serology or intradermal skin testing) simply detects allergen-specific IgE; showing a positive reaction does not necessarily mean that the response

is clinically relevant. Thus, it is important to correlate the positive reactions detected in the allergy test with the seasonality and the environment of the patient to increase the likelihood of formulating a vaccine that includes clinically relevant allergens for each specific patient.[6] Debate exists on which type of allergy testing is the best. It is important to recognize that these 2 tests measure different things. Serology testing measures circulating allergen-specific IgE, while intradermal skin testing detects cutaneous allergen-specific IgE. It is also important to note that different companies typically use different sources of allergens. These facts help explain why the correlation between various tests is typically not very good.[7] Fortunately, the single most important aspect in formulating a successful immunotherapy is not which test is used but how the allergens are selected (ie, emphasis is placed on correlating the results with the seasonality and environmental exposure of the individual patient to increase the likelihood of including clinically relevant allergens among the ones that tested positive).

It is commonly accepted by dermatologists that allergen-specific immunotherapy can be of help to atopic horses. Few controlled studies have been done to date. Reported success rates vary from 60% to 80%.[8–10] This clinical impression has been supported by a recently published retrospective study that documented owners' impression of response to allergen-specific Immunotherapy.[11] In this study, 84% of owners reported a good response. More specifically, 93% of owners reported having to use glucocorticoids before initiating allergen-specific immunotherapy, and after 1 year of therapy 59% of cases were managed with immunotherapy alone. There was no statistical difference between type of test and reported success of allergen-specific immunotherapy, emphasizing that the key to success of immunotherapy may not lay in the specific test used. As a general rule, most horses show improvement after the first 6 months of therapy and some even after the first 3 months. Immunotherapy should be continued for a full year to completely assess for benefit.

FOOD ALLERGY

Therapy of horses with food hypersensitivity requires avoidance. Currently, allergen-specific immunotherapy is only done for environmental allergens and has not been used for food allergy. Successful therapy therefore relies on the proper identification of the correct food trigger. This requires a food trial with rechallenge to demonstrate that worsening of clinical signs occurs after exposure to certain foods. Once this is done, these foods are strictly avoided in the main diet as well as in any flavored supplement given to the horse. Knowledge of labels of the various commercial diets is essential. Common problematic diet ingredients include hays rich in protein such as alfalfa or peanut. Soybean is also a frequent culprit. Potential exposure to this needs to be researched, as soybean is frequently included in commercially prepared feeds, making long-term management difficult when using these commercially prepared feeds.

CONTACT ALLERGY

Therapy for contact allergy also relies on identification of the offending allergen and by practicing avoidance. Contact allergy is a type 4 hypersensitivity and is not amenable to immunotherapy. Identification of the offending allergen can be done by isolation and rechallenge or, more specifically, done by patch testing. In the patch test, small amounts of suspected substances ranging from plants to shavings or even sprays are placed onto an area of skin 24 to 48 hours after shaving. These test allergens are kept under an occlusive patch for 24 to 48 hours. After this period of time, the

patch is removed, and the reaction is evaluated over the following 24 to 48 hours. A positive reaction is indicated by erythema and a papular reaction at the site of application.

For cases in which patch testing or avoidance cannot be done, it is useful to try pentoxifylline. This drug has been shown to decrease the severity of contact allergy in humans, dogs, and rodents.[12–14] Although studies have not been done in horses, it seems to help horses with allergies, including contact allergy. Pentoxifylline is typically well tolerated, but it can be costly for long-term use. Severe cases may still require glucocorticoid therapy to decrease clinical signs with acute flare-ups. It is also important to note that shampoo therapy to wash off the allergen is an important part of therapy. Mild, moisturizing shampoos with oatmeal can be used to decrease pruritus and self-trauma.

URTICARIA

One of the many manifestations of allergies in horses is urticaria. The causes for chronic urticaria in horses are numerous. Part of the treatment of these frustrating cases emphasizes the identification and management of the triggering cause. For this reason, it is important to take a through history, including information about exposure to drugs, vaccines, dewormers, supplements, and feeds. In some cases, urticaria is triggered by cold temperature, water, exercise, physical trauma, or pressure. Some cases are related to insect hypersensitivity, and others have pollen allergies and/or food allergies.[15] When a cause cannot be identified, symptomatic treatment is the only option. In most cases this involves the long-term use of glucocorticoids, because antihistamines are typically of limited benefit. Of all antihistamines, hydroxyzine is probably the most helpful to try. Pentoxifylline should also be tried. This drug has been shown to stabilize mast cells in other species.[16]

SUMMARY

In summary, the treatment of allergies in horses requires a comprehensive approach to identify and correct all possible contributing factors. The clinician should therefore be aware of the various contributors to the pruritus of each specific case and attempt to either treat or control each of them. For individuals with long seasons of environmental allergies, immunotherapy remains the best long-term option.

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