DIAGNOSING AND MANAGING SKIN ALLERGIES PRESENTED IN HORSES

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Categories: Vets

Date: March 28, 2011

Janet Littlewood discusses the differential diagnoses to be considered in horses showing signs of pruritus or urticaria and the approaches to treatment.

Summary

Allergic skin disease in the horse is a relatively common clinical presentation. While Culicoides hypersensitivity can be relatively easily recognised, other causes of cutaneous allergic reactions may be more challenging to identify. The differential diagnoses to be considered in horses and ponies presented with pruritus, and/or chronic or recurrent urticaria, are discussed. The diagnostic approach to the investigation of such cases includes a thorough clinical history, examination of epidermal material for ectoparasite identification, restriction and provocation testing. In cases where other causes have been ruled out, the demonstration of allergen-specific IgE by intradermal testing is helpful in identifying causal factors in individual cases and allows suitable management strategies to be devised.

Key words

Horse, allergy, atopic dermatitis, urticaria, intradermal testing

THE hallmarks of allergic type one hypersensitivity equine immunoglobulin E (IgE)-mediated disease are erythema, pruritus and urticaria.
Erythema is often difficult to appreciate in equine patients, but pruritus and chronic or recurrent urticaria are relatively common presentations in horses and ponies and some of these cases can present a significant diagnostic challenge to the owner and clinician.

Equine IgE has been characterised, and mast cell-bound IgE demonstrated, in equine skin. IgE-mediated reactions have been implicated in some infectious conditions, such as dermatophytosis, but this article will focus on the approach to those patients that present with pruritus and/or urticaria as their main problems.

Other types of cutaneous hypersensitivity disorders are also recognised in horses, including contact hypersensitivity reactions, which usually involve type four delayed hypersensitivity mechanisms. The history and distribution pattern of lesions usually suggests a contact reaction, and the presentation is not often one of generalised pruritus or urticaria, so these reactions will not be considered further.

Pruritus can be a very disabling symptom, resulting in significant self-trauma and, in severe cases, loss of body condition due to time spent rubbing and not eating (Figure 1a). Cutaneous lesions reflect the intensity of the itch and include broken and damaged hairs, alopecia, erosions, excoriations, thickening and hyperkeratosis (Figures 2a and 2b).

Urticarial lesions (Figure 3) may range from small, papular eruptions (hives) to annular, linear, ring or serpiginous wheals, plaques and sometimes extensive oedematous plaques with serum ooze (angio-oedema). These lesions can usually be differentiated from lesions due to cellular infiltration by demonstrating pitting on pressure. Horses with urticaria may be variably pruritic or completely non-pruritic. Some cases with extensive urticarial lesions can appear depressed, due to the systemic effects of histamine release.

The differential diagnoses to be considered in patients presenting with pruritus and/or urticaria include ectoparasite infestations, insect bite hypersensitivity, atopic dermatitis, drug eruptions, dermatographism, exercise-induced urticaria and adverse cutaneous food reactions.

**Ectoparasite infestation**

The severity of pruritus associated with ectoparasite infestations (Table 1) is variable, and this variability may reflect individual variation in IgE response to the parasite. Thus, in some patients, the pruritus is associated with physical effects of infestation with large numbers of parasites, whereas in other cases, severe pruritus may be present, in spite of very low numbers of parasites, because of an IgE antibody response in the host. This latter situation is often seen in sarcoptic mange in all species, and while it is an uncommon cause of pruritus in equids in the UK, occasional cases are recognised.

In cases of trombiculidiasis it is not unusual for the larval parasite to have already detached after its
blood meal by the time the veterinarian is called in to attend the pruritic horse. In such cases, examination of other in-contact horses exposed to the same environment may demonstrate the presence of harvest mite larvae when none are to be found on the presenting case.

**Insect bites**

Of the conditions more typically considered to be of allergic aetiology, insect bite hypersensitivity, or *Culicoides* hypersensitivity, is the most common. The feeding pattern of midges gives rise to the classical presentation of self-inflicted alopecia and skin damage along the dorsal midline, but also the ventral midline and around the head in susceptible, hypersensitive animals. The true prevalence of the disease is probably underestimated by published studies, since the condition, known by its common name of sweet itch, is well recognised by horse owners and cases are frequently managed without recourse to veterinary surgeons. This condition has been the subject of a spotlight article (VT41.02) and will not be discussed further.

The horse, more than any other domesticated species, is particularly prone to developing urticarial reactions. In the majority of cases (probably around 60 per cent) these episodes are isolated occurrences that respond promptly to short-acting glucocorticoid therapy and do not recur, so the underlying trigger factor may never be identified. A symptomatic approach to therapy in animals presenting with urticaria on the first occasion is entirely appropriate. In cases where the urticarial lesions persist or recur for longer than six weeks, further investigations to attempt to identify the cause are indicated (Table 2).

**Dermatographism**

Cases of dermatographism – where cutaneous mast cells degranulate as a result of pressure – are usually easily recognised by the clinical presentation. Oedematous wheals and linear lesions will appear within 15 to 30 minutes of the application of pressure (Figure 4). Dermatographism may be seen in horses with underlying allergic disease, but in humans may be independent of any atopic tendency.

**Exercise-induced urticaria**

Exercise-induced urticaria, as the term suggests, is associated with physical exertion, although environmental and/or nutritional factors may contribute to the manifestation of the problem.

**Drug eruption**

Urticaria can be a presenting sign in drug eruptions, and so a careful history to elucidate recent drug administration, including over-the-counter remedies and supplements, is essential in cases presenting with urticaria. Urticaria can sometimes be difficult to differentiate, on clinical grounds,
from erythema multiforme, an immune-mediated disease, which may also be associated with drug eruptions. In cases where uncertainty exists as to whether papular, serpiginous or ring-shaped lesions demonstrate pitting on pressure, then skin biopsies are indicated for histopathological examination.

In contrast to erythema multiforme, the histopathological features of classical urticaria are notably unexciting, with the superficial dermis often appearing very empty because of oedema, and often only lowgrade, superficial, perivascular dermatitis present, often including eosinophils. Mast cells are frequently difficult to identify because they have degranulated. As a general rule, skin biopsy for histopathological examination is rarely of any great benefit in the investigation of allergic skin disease in horses, apart from ruling out other causes of nonallergic origin of papular to linear or raised lesions.

**Diet**

Adverse cutaneous food reactions are commonly suspected by owners of horses that suffer from urticaria and/or pruritus. However, while the condition is included in standard texts and reviews, no good case series or individual case reports exist in the literature documenting the condition. It must, therefore, be concluded that food triggers are a rare cause of allergic skin disease in the horse.

While several laboratories offer serological tests to identify antibodies against various food antigens, these tests are known to have no validity in diagnosing adverse cutaneous food reactions in other species. And in the horse, where the condition is rare, these assays have not been properly validated and are not considered worth undertaking.

The only valid diagnostic tool for investigating potential food triggers is elimination and provocation testing. It is difficult to select a narrow recipe diet with completely novel constituents for the horse and it is not known for how long an elimination diet should be fed. A pragmatic approach adopted by this author is to discontinue all short or concentrated feeds and additives and feed a good-quality grass product – preferably a vacuum-packed wilted product rather than hay – to try to avoid exposure to grass and weed pollens and contamination by moulds and forage mites that may be in the hay.

Grass cubes can be fed instead of the usual concentrate feed. If the horse has not previously been exposed to alfalfa, this would be an appropriate choice of diet, since it offers reasonably good nutrition. However, many horses in the UK have now been exposed to this grass product.

The elimination diet is fed for a minimum of four weeks. If the pruritus or urticaria resolves over this period, then dietary provocation, by the introduction of one foodstuff at a time, is indicated in an attempt to identify the causal factor. It is likely that clinical signs will recur within hours to days of re-exposure to the allergen in cases of type-one hypersensitivity.
Despite diligent attempts, this author has yet to identify a case of adverse cutaneous food reaction in any horse referred for investigation of urticaria or pruritus. The only well-documented case of a food-related cutaneous problem in the literature was a case of non-pruritic alopecia due to telogen defluxion associated with a particular food supplement, rather than urticaria or pruritus (Jubb and Graydon, 2007).

**Atopic dermatitis**

Atopic dermatitis due to hypersensitivity to environmental triggers is well recognised, although there are only a few good reviews of cases in the literature. A retrospective study of 50 horses referred for investigation of pruritus and/or recurrent urticaria in the south of England has been published (Rendle et al, 2010).

Atopic dermatitis may occur in any breed of horse, with a variable age of onset. In some cases there is obvious seasonality. In the author’s experience many atopic horses are sensitised to dust mite and forage mite allergens found in indoor environments, and so manifest clinical signs when they are stabled, either all or most of the time. Mould allergens have also been implicated in equine atopic dermatitis, in addition to a range of tree, grass and weed pollens. These latter animals show spring to summer seasonality.

*Culicoides* or insect-bite hypersensitivity and atopic dermatitis may occur concurrently in the same horse. The distribution of lesions is less well defined in the atopic horse than in canine atopic dermatitis, although facial irritation and perineal irritation are not unusual, and urticarial lesions are quite often seen on the ventrolateral aspects of the neck and trunk, suggesting that the percutaneous route of allergen exposure may be the major aetiopathogenesis, as in dogs.

An inherited tendency to *Culicoides* hypersensitivity is well recognised, and there is evidence that the risk of atopic dermatitis may also run in families, so owners of affected animals should be advised against breeding.

The diagnosis of atopic dermatitis in the horse, as in other species, is made by ruling out all other potential differential diagnoses (Table 2). Once a clinical diagnosis has been made, identification of causal allergens is helpful in the management of cases, enabling advice to be given regarding allergen avoidance, where possible, and offering the option of allergen-specific immunotherapy.

Intradermal testing is considered to be the gold standard for demonstration of cellbound allergen-specific IgE in the superficial dermis (Figure 5). A number of serological assays for the demonstration of allergen-specific IgE in the circulation are available, but published studies comparing various assays, methodologies with intradermal testing in horses with atopic disease have shown very little to no correlation with intradermal test results (Lorch et al, 2001; Morgan et al, 2007).

Some work has been published concerning optimal concentrations of allergens for intradermal use
in equids, but there is no accepted consensus and allergens that may be of importance in the UK may not have been studied in other geographical locations (Baxter and Vogelnest, 2008). Intradermal test kits are expensive and have to be imported under special import certificate (European source) or special treatment certificate (non-European source) issued by the VMD.

A degree of operator experience is considered to be important in carrying out intradermal testing and so the availability of the procedure is generally limited to specialist dermatologists with an interest in equine skin disease and equine clinicians working in a referral setting. However, the conclusions of a paper by Rendle et al (2010) and the experiences of this author, support the technique of intradermal testing as a very useful tool in formulating a logical approach to the treatment and management of atopic dermatitis in horses (Jose-Cunilleras et al, 2001).

For horses with atopic dermatitis triggered by indoor allergens, modifications to management to avoid or reduce allergen exposure (Table 3) can be very successful (Figure 1b).

Avoidance of pollen allergens may be more difficult unless the horse can be stabled full time, but there may be risk of exposure when the horse is exercised, as well as when at pasture. Use of selective weed killers on pastures may eliminate some broad-leaved weeds, but for pollen-allergic animals, as well as those that fail to respond adequately to the avoidance of indoor allergen triggers, allergenspecific immunotherapy can be very helpful.

While there is little in the published literature about the efficacy of this therapy in horses, opinion suggests that approximately 60 per cent of horses derive benefit, but a period lag of several months is likely before it is seen. In the interim, symptomatic control may be indicated. Antihistamines can be used alone or for steroid-sparing effect. Drugs that may be of benefit are listed in Table 4. These drugs are not licensed for use in horses.

Atopic skin disease usually responds well and promptly to low anti-inflammatory doses of glucocorticoids. Prednisolone 0.5-1mg/kg per os is given once daily until clinical signs are controlled, followed by alternate day therapy and gradual reduction to the lowest possible alternate day dose to keep the animal comfortable and lesion-free. Bathing with soothing/emollient shampoos containing colloidal oatmeal and or aloe vera extract may help remove allergens from the skin surface and give symptomatic relief.

Hydrocortisone aceponate spray, licensed for small animal use, is proving very useful as an adjunct to the management of horses with allergic skin disease, and has an advantage as the drug only penetrates to the superficial dermis, and thus is not associated with any systemic effects of glucocorticoid administration. Anecdotally, oral administration of aloe vera gel may also be of benefit.

Insect avoidance measures are indicated in atopic horses suffering from concurrent Culicoides or insect bites and summarised in Table 5.
Nicotinamide orally and/or topically may also be of benefit in the management of sweet itch.

**Summary**

With a logical approach to horses presenting with pruritus and/or recurrent urticaria, it is usually possible to reach a definitive diagnosis and allow for an appropriate treatment regime to be implemented. The involvement of a dermatologist or equine clinician with experience in the technique of intradermal testing in horses can be extremely helpful in both pinpointing the causal factors in affected individuals and offering advice to owners of such cases regarding approaches to controlling allergic skin disease in their animal.

**References and further reading**