Immune-mediated diseases in dogs and cats

Immune-mediated conditions are uncommon to rare and result from an abnormal immune response to foreign antigens. They can be difficult to diagnose, because clinicians often rely on histopathology alone for a diagnosis; however, many cases require the clinician to make a clinical diagnosis first and then use histology to support it, or rule it out. In this paper the clinical signs and diagnosis of erythema multiforme, Stevenson-Johnson syndrome/toxic epidermal necrolysis and vasculitis are discussed. These conditions often wax and wane and their prognoses are guarded to poor. Many cases will require long term management with immuno-modulating drugs which can have adverse effects. There are a number of drugs with immuno-modulating properties each of which may have various adverse effects with long term use. Treatments should, therefore, be individualised and based on the condition, extent of disease and probable adverse effects of the medication.

Key words: erythema multiforme, Stevenson-Johnson syndrome, toxic epidermal necrosis, vasculitis

Introduction

Immune-mediated skin diseases are uncommon to rare and are associated with an unpredictable response to foreign antigens such as viruses, bacteria, fungi, food or drugs. The immune response is targeted to cells in the epidermis, the dermoeipidermal junction and blood vessel walls. The diagnosis of immune-mediated diseases hinges on marrying the clinical signs with histological findings; and in many cases the latter alone do not confirm the “text book” diagnosis that clinicians rely on. The histological findings vary depending on:

1. Lesions biopsied (primary lesions are more likely to show typical changes for the disease, whereas in secondary lesions the changes are less likely to support or confirm the diagnosis)
2. Timing of the biopsy (early or late in the disease process)
3. Prior treatment of the disease

The treatment and/or management of these diseases is often difficult and the prognosis is variable. In this paper the following immune-mediated conditions will be discussed:

- Erythema multiforme (EM)
- Stevenson-Johnson syndrome (SJS) / Toxic epidermal necrolysis (TEN)
- Vasculitis

In a recent comparative review, Yager (2014) makes an excellent argument that erythema multiforme and SJS/TEN are separate conditions and not as previously described, overlapping diseases, which were originally classified according to the severity and extent of the clinical signs. As a result of that review they will be classed as different conditions in this paper. The review also shows that SJS / TEN in animals is similar to the disease in humans whereas EM in animals is different from EM in people.

There are a number of treatment/management options for these conditions, but there is no solid evidence to support any one in particular because of their rarity.

Erythema multiforme

This is an uncommon condition, usually acute onset, seen in dogs and cats. In dogs, depending on the extent of the body involved and the severity of lesions it is classified as erythema multiforme minor (EM minor) and erythema multiforme major (EM major). EM minor in cats and dogs has a wide range of lesions with truncal, axillary and inguinal, mucocutaneous, head and or generalised distribution with none or one mucosal site involvement. The affected animals have no systemic signs. Although dogs with EM major have similar lesions and distribution more than one mucosal site is involved and the dogs have systemic signs (Yager 2014). The condition in cats is less defined.

Clinical signs

The distribution of the lesions is symmetrical and tends to involve the trunk (mainly axillae and groin), head and mucocutaneous areas. In dogs the lesions tend to be on the concave aspects of the
Figure 1: Erythematous papules and crusts on the medial aspects of the pinnae in a Rottweiler with EM major.

Figure 2: Erythematous papules, crusts and plaques involving the ventral abdomen, inguinal regions and prepuce.

Figure 3: Annular configuration of crusting, erythema and central hyperpigmentation in a dog with erythema multiforme.

Figure 4: Symmetrically presented ulcerative lesions on the concave aspects of pinnae in a cat with erythema multiforme.

Figure 5: Ulcerative lesions on the anal area of the cat in Figure 4.

Figure 6: Large areas of necrosis in dog with toxic epidermal necrosis.

Figure 7: Right side ulceration on dog in Figure 6.

Follicular epithelium can also be involved. Hyperkeratosis and parakeratosis are seen in canine EM, which is sometimes then referred to as hyperkeratotic EM.

Stevenson-Johnson syndrome/Toxic epidermal necrolysis
Stevenson-Johnson syndrome (SJS) and toxic epidermal necrosis (TEN) are rare diseases often associated with drugs and neoplasia. They are considered to be a milder and more severe form of the same condition that bears similarities to human TEN. They are characterised by epidermal detachment; SJS has < 10% detachment and TEN more than 30% epidermal detachment. These conditions are dermatological emergencies and they have a poor prognosis with a high mortality rate.

Clinical signs
The conditions have an acute onset and often the animals may have systemic signs. The lesions are painful and tend to involve large areas. In their early stages both conditions have similar signs of erythematous or purpuric, macules, or patches, involving the trunk, mucocutaneous junctions and/or oral cavity. Often these signs soon develop into erosions and ulcers with large areas of detachment (Figures 6 and 7).