

An Emerging Ferret Disease: DIM

Disseminated idiopathic myofasciitis is one of the latest diseases of concern in ferret medicine.

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Clara is one of more than 50 ferrets confirmed to have contracted disseminated idiopathic myofasciitis.
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More than five years ago I treated my first cases of disseminated idiopathic myofasciitis (DIM). The earliest known case of DIM is from 1999. Although research on DIM has been ongoing since it was first recognized and described in 2003, vital pieces are still missing to the puzzle of this mysterious disease. Fortunately, we now have hope.

What Is DIM?

DIM is a relatively new disease in domestic ferrets that causes a severe inflammatory condition that primarily affects muscles (myositis). It is also known as polymyositis (inflammation in multiple muscles) and myofasciitis, (inflammation in muscle and surrounding tissue). It is a life-threatening illness, and was considered an incurable disease until about a year ago.

Ferrets are suspected to have DIM when they have consistent clinical signs and diagnostic results. The disease is confirmed when a histopathologist observes specific abnormalities in the tissues. To date, DIM has been suspected in more than 100 ferrets and confirmed in more than 50.

What Ferrets Are Affected By DIM?

DIM generally affects both genders of ferrets less than 18 months of age. Ferrets diagnosed with DIM have been from various breeders, and they have been on various ferret and feline diets. Many of the ferrets lived in multi-ferret households, with the other ferrets in the same household unaffected, even several months to years after exposure to a ferret with DIM. An evaluation of the available vaccine histories showed that every ferret had received at least one dose of the same canine distemper vaccine.

What Are The Signs Of DIM?

The onset of clinical signs for DIM is usually fairly sudden and often becomes apparent to an owner over a period of 12 to 36 hours. However, the duration of the illness can be days to weeks, or even months, and is considered fatal if not treated.

Initial signs of DIM are variable but commonly include a severe, persistent, fluctuating fever (often 104 to 108 degrees Fahrenheit); severe tiredness and weakness; dehydration; enlarged lymph nodes or masses under the skin; abnormal stools; and a decreased appetite. Ferrets with DIM often show increased sensitivity or pain when they are touched, especially in the hind end or on their lower back.

Other signs associated with DIM include increased heart and respiratory rates (more common as the disease progresses); clear, watery nasal discharge; eye discharge; skin changes; tooth grinding (indicating pain and/or nausea); pale gums; heart murmurs; panting; coughing; and seizures. Most affected ferrets are depressed but aware of their surroundings. Over a period of days to weeks, ferrets with DIM continue to progressively decline and die or are euthanized. Not all ferrets affected with DIM exhibit every clinical sign, although most will display several of the signs.

Diagnostic Results That Indicate DIM

Ferrets with DIM usually exhibit a dramatic increase in neutrophils (a type of white blood cell often observed with infection and/or inflammation) and a decrease in red blood cells (anemia). Glucose and one liver value (alanine aminotransferase, ALT) may be increased, and albumin (a type of blood protein) is usually decreased. Interestingly, creatinine kinase (CK), a value typically elevated with damage to muscle tissue or severe inflammation, is not elevated in ferrets with DIM.

Ferrets suspected to have DIM that underwent additional diagnostic tests were negative for infectious diseases, including those caused by bacteria, parasites, fungi and many viruses. Examination of tissues from deceased DIM ferrets showed severe inflammation in all muscle groups, with the esophagus being most affected. It is likely that the clinical signs observed in DIM patients are due to the pain and atrophy that accompany this condition. Biopsies from living ferrets usually show widespread inflammation and pus in lymph nodes and muscle tissue. The inflammation is not evenly distributed throughout the muscle tissue of ferrets with DIM, so it is possible for ferrets with DIM to have a negative

muscle biopsy.

Is There A Treatment for DIM?

Until recently, one characteristic of ferrets with DIM was a general lack of response to treatment, and DIM was considered an incurable disease. Over the last two years, some ferrets confirmed to have DIM and several ferrets suspected to have the disease have responded very well to the current treatment protocol. Interestingly, a ferret suspected to have DIM returned to normal health following treatment one year ago, but he relapsed with signs of DIM in January 2008. The ferret is again receiving the current recommended treatment, and we are waiting to see if he will recover.

Potential Causes For DIM

Failure of DIM patients to respond to a variety of antibacterial drugs and the inability to demonstrate bacteria in the tissues indicates that DIM is unlikely caused by bacteria. DIM is likely a disease associated with disruption of the immune system. Immune-mediated vaccine reactions are common, and vaccines and vaccine components are being investigated as a potential cause for DIM. In a recent report, the only known commonality among all of the DIM confirmed ferrets was the administration of at least one dose of a commercial canine distemper vaccine licensed for use in ferrets, which is no longer being produced. The number of reported DIM cases has decreased significantly over the last year, but it is unknown whether this decline is associated with discontinued use of the vaccine.

Canine distemper is a prevalent disease in unvaccinated dogs and wild raccoons, and it is contagious to and usually fatal in ferrets. Therefore, it is imperative that all pet ferrets continue to be vaccinated properly against canine distemper and rabies as currently recommended. DIM on the other hand is considered a relatively uncommon disease, and hopefully we may be able to control it, if not cure it, in affected ferrets.

Recommendations

Ferrets suspected to have DIM should undergo a comprehensive physical examination, a complete blood panel and a urinalysis. When clinic signs and diagnostic results are consistent with those of DIM, surgical biopsies of muscle tissue (and lymph nodes if available) should be obtained. Because the inflammation has an uneven distribution, two external skeletal muscle biopsies are recommended to confirm DIM.

Deceased ferrets (regardless of prior treatments) should have a wide range of tissues collected, including esophagus, skeletal muscle and heart. Supportive care, including supplemental feedings, fluids and broad-spectrum antibiotics, should be given until a definitive diagnosis can be made. If a ferret is diagnosed with DIM, then the current treatment protocol may be extremely beneficial. Veterinarians should contact me to discuss the current DIM treatment protocol if they have a suspected or confirmed case.

The Quest Continues

We are only beginning to put the pieces of the DIM puzzle together. Identifying a direct cause for DIM, understanding the mechanism of the disease process, finding a cure and finding a means to prevent the disease are all goals encompassed within the research efforts. Increased awareness of DIM and submission of accurate case reports with complete histories will help veterinarians and researchers to ferret out the answers to this mysterious disease.

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