

AFA COMMITTEE ON HEALTH AFFAIRS SPECIAL MEDICAL ALERT

Disseminated Idiopathic Myositis in Ferrets

By Freddie Ann Hoffman

Disseminated Idiopathic Myositis (DIM) appears to be a "new" disease in ferrets. The cause is unknown. DIM was first described in 2003 independently by Drs. Katrina Ramsell and Mark Burgess (Southwest Animal Hospital, Beaverton, Oregon), Dr. Michael Garner (NW Zoopath, Washington), and others. Usually it results in a fatal inflammatory condition of muscles, or "myositis." At least 20 cases have been described to date, all occurring in young ferrets ages 5 to 12 months. It is unknown if the condition is contagious: many cases were ferrets living alone for months; other cases lived with other ferrets who have remained unaffected.

PHYSICAL SIGNS

Fever (> 104° F), tiredness, weakness, reluctance to move, pain on handling (over the back or hips), depressed appetite; enlarged single or multiple external lymph nodes on leg(s) or neck area.

LABORATORY SIGNS

White blood count initially may be normal, but within seven to ten days, typically mature neutrophils can rise to 14-90 (cells per µl blood); mild to moderate anemia (initially nonregenerative, new Red BCs seen later); serum chemistry tests: creatinine kinase (CK) and aspartate aminotransferase (AST, both enzymes detect muscle damage) are usually normal. **Alanine aminotransferase (ALT, a liver-specific enzyme)** has been elevated in one in four ferrets. Bilirubin is unremarkable.

PATHOLOGY

Biopsy: lymphnode: suppurative ("produces pus") to granulomatous inflammation. Postmortem: widespread suppurative inflammation affecting skeletal, cardiac, and smooth muscles (esophagus, skeletal muscles, heart, gastrointestinal). Non-muscular organs such as liver have also been affected. Testing has been negative for infectious organisms (cultures, special stains and electron microscopy, and viral isolation studies for bacteria, Rickettsia, viruses, etc.).

ETIOLOGY/TRANSMISSION

Unknown cause; sporadic—infectivity is unknown.

DIAGNOSIS AND TREATMENT

Presumptive: based on physical and laboratory signs (see above); *Definitive:* biopsy/necropsy of external skeletal muscle (e.g., leg). Supportive treatment: hand-feeding, IV fluids if the patient is very ill; broad-spectrum antibiotics such as enrofloxacin (Baytril®) and amoxicillin may minimize secondary infections.

In a series of 4 cases, one ferret initially made a transient recovery following administration of Interferon-alpha (IFN-α) (orally 600 I.U. per day for two months): WBCs and behavior returning to normal. After several weeks in remission, this animal relapsed, WBCs again reaching 40.0 (per µl). Similar results have not been observed in other



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ferrets. (NB: oral IFN- α is not approved in either animals or humans for any indication.) The following drugs have not shown efficacy: corticosteroids, antibiotic combinations (penicillins, cephalosporins, tetracyclines, quinolones, such as Baytril®, metronidazole, or chloramphenicol. Brief improvement on antibiotics might be due to treating a secondary bacterial infection.

COURSE/OUTCOME

Severe, rapid onset, or progressive over several weeks; most cases to date have been fatal. Mean survival following diagnosis is unknown.

RECOMMENDATIONS

This alert is for informational purposes only and should not be construed as veterinary advice. This alert is intended to assist practitioners and pathologists in recognizing the condition. In order to develop a better understanding of this condition, your assistance is needed in collecting information about each new case.

VETERINARIANS:

1. **Accurate Diagnosis:** Conduct appropriate diagnostic evaluations (biopsy/necropsy; blood tests, cultures for bacteria and other micro-organisms). Proper collection of tissues is paramount. Cultures for micro-organisms should be collected **prior to starting antibiotics**, using appropriate sterile collection techniques. *Fresh* tissues (or pieces of whole unfrozen tissues in saline) should be saved and immediately submitted to a microbiology lab for both aerobic and anaerobic cultures. Surgical biopsies should be bisected and

several touch imprints of the cut surface prepared and air-dried for cytologic examination and gram staining, half of the tissue placed in formalin; the other half immediately frozen for bacteriological examination. Untreated animals presenting for necropsy should have the widest range of tissues collected, including bone marrow. Again, equal tissue samples should be formalin-fixed and frozen. Screening of cytologic preps and formalin-fixed tissues will be performed to determine whether further investigation (bacteriology, virology, etc.) is warranted.

Pathology samples are requested by: Dr. Michael Garner at NW Zoopath, 360-794-0630 or zoopath@aol.com, or Dr. Bruce Williams, AFIP, 202-782-2392 or williamsb@afip.osd.mil.

- 2. **Supportive treatment is warranted** (rehydration; feeding). Administration of antiviral drugs, such as IFN- α , might be considered.
- 3. For each presumptive case, please complete the AFA DIM Case Report Form (see pages 17-18, or visit the AFA Web site at www.ferret.org).
- 4. *Veterinarians only:* For questions regarding the above, contact the Southwest Animal Hospital, 503-643-2137 burgess@swanimalhospital.com. Clients should work through their veterinarians and not call directly.



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Ferret owners: If you suspect your ferret has DIM, contact your veterinarian as soon as possible.

For up-to-date information, please visit the AFA Web site at www.ferret.org.

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