VETERINARY TEACHING HOSPITAL

VIRGINIA VETERINARY NOTES

VIRGINIA-MARYLAND REGIONAL COLLEGE OF VETERINARY MEDICINE

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WHAT'S INSIDE!

THOUGHT FOR THE MONTH

Life is something that happens to you while you are making other plans.
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VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

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THE ITCHY CAT

Atopy

Atopy is a genetically influenced disorder which causes the animal to become allergic to environmental antigens that are normally innocuous. Atopy is considered to be uncommon in cats, but it appears to be increasing in frequency. With the exception of purebred cats (where signs may occur early in life), most atopic cats begin to itch when between three to five years-of-age. Over 85% of atopic cats itch during warm weather. Atopic dogs commonly progress from seasonal to non-seasonal pruritus, but most atopic cats stay seasonal for long periods of time.

Clinical signs are quite variable and their severity often determines when the cat is presented for treatment. Intensely pruritic cats are usually presented shortly after the itching starts. Cats who just groom excessively may not be presented for weeks to months after the onset of signs. As a result of the variability of signs and timing to presentation, it can be difficult to offer the tentative diagnosis of atopy based upon the owner's perception of the onset of pruritus. Good records are necessary to document the seasonally recurrent nature of the cat's problem.

The physical findings in atopic cats are minimally specific, and include facial pruritus, recurrent otitis externa, head and neck pruritus, miliary dermatitis, whole body pruritus, traumatic alopecia, eosinophilic plaques, and eosinophilic granulomas with collagen degeneration. The steroid response test is very helpful in ruling out atopy. An uncomplicated atopic cat routinely stops itching when the appropriate dose (2.2 mg/kg/day) of prednisolone is given; a poor response indicates that the cat is not atopic. (Bear in mind that bacterial folliculitis and *Malassezia* dermatitis may be confounding disorders, especially if steroids have been used previously.) However, a positive response does not invariably mean that the cat is atopic.

Excluding other causes of pruritus is the most practical method of supporting the diagnosis of atopy, but allergy testing is the most specific. Allergy testing not only confirms the diagnosis, but it also defines the specific allergens so immunotherapy can be formulated. First generation serologic allergy tests have such poor sensitivity and specificity that they are of questionable value in the cat. However, several companies (Heska, VARL) have modified the tests in order to bypass some technical problems associated with ELISA testing. These improved tests appear to have reduced or eliminated the incidence of false positive results previously due to flaws in the test. Because ELIS tests are capable of measuring very low levels of IgE, they will detect clinically insignificant antibody levels. Accordingly, all positive test results must be carefully evaluated in light of the patient's history. Intradermal testing is the gold standard of allergy testing, and is associated with a very low incidence of false positive reactions. It rarely, if ever, detects clinically insignificant reactions.

Treatment:

<u>Corticosteroids</u>

Cats are resistant to steroid side effects, so these drugs are used with regularity in atopic felines. For cats with a short allergy season, DepoMedrol® injections (4-5 mg/kg) are commonly administered. If a young healthy cat requires no more than 3 or 4 injections per year, the margin of safety of this method of treatment is wide. If more frequent injections are required or if the cat is old, oral steroids are safer. Prednisone (2.2 mg/kg/day) and methylprednisone (1.8 mg/kg/day) are safest but some cats do not respond. The drug is initially given daily to heal the rash, followed by alternate day administration to keep things under control. Dexamethasone (0.2 mg/kg/day) or triamcinolone (0.2 mg/kg/day) usually work in prednisone-resistant cats, but these drugs are not as safe because of their longer duration of action. The latter two drugs should be used every third day if possible. When steroids are not an option, nonsteroidal drugs or immunotherapy vaccines may be beneficial.

Antihistamines

Antihistamines can minimize the impact of histamine on the animal's pruritus. Since histamine is only one of many mediators of pruritus, antihistaminic agents are not uniformly effective. However, in some patients, the results with antihistamines are as good as they are with corticosteroids. Antihistamines should be avoided or used with caution in pregnant animals or those with glaucoma, seizure disorders, fluid-retentive disorders, heart disease, or known allergies to antihistamines. Antihistamine overdose can be fatal. Since ketoconazole is known to alter the hepatic metabolism of antihistamines in humans, it is prudent to avoid concurrent administration of ketoconazole and antihistamines to dogs and cats. If both agents need to be used simultaneously, the patient should be monitored carefully. Of the hundreds of antihistamines available, the following have proved to be effective in cats.

Drug	Dosage
Chlorpheniramine	2-4 mg/cat q12h
Clemastine	0.68 mg/cat q12h
Cyproheptadine	2 mg/cat q12h

Fatty Acid Supplements

The first report on the antipruritic effects of specially-formulated fatty acid supplements appeared in the veterinary literature in 1988. That report and others prompted intense study of these agents. These special supplements can control pruritus in some animals, but the best formulation and the optimum dosage is not known. Several studies have shown that dogs are very individualistic in their response to these supplements, suggesting that there is no one best formulation. The same is probably true in cats as well. If one supplement does not work, another with a different formulation should be tried. If a supplement is to be effective, results will be seen within 21 days after the initiation of treatment.

Supplement	Dosage
DermCaps®	Per label
EfaVet®	Per label
Gamma Linolenic acid	>8 mg/kg q24h

Drug Combinations

Because of the vast number of mediators of pruritus and the narrow focus of nonsteroidal agents, simultaneous administration of two or more drugs, each with a different target mediator, can improve the response to treatment. The steroid-sparing effects of antihistamines and DermCaps® have been proven, as has been the additive benefit of administering DermCaps® with antihistamines. The author routinely dispenses DermCaps® with antihistamines; if the combination proves to be effective, the antihistamine is discontinued to determine if the DermCaps®, the antihistamine, or the combination of both, are responsible for the patient's improvement.

Immunotherapy

Immunotherapy is the most specific form of treatment for atopy. Additionally, some veterinary allergists believe that effective immunotherapy prevents the development of new allergies. Clinical response is allergen-specific, so an allergy test must be performed to formulate a specific vaccine. The response rate in cats is approximately 75%, and adverse reactions rarely, if ever, are reported.

Immunosuppressive Treatments

Simplistically speaking, allergy is an overactive immune response to an allergen. Unfortunately, if the allergen cannot be avoided or if the pruritus cannot be controlled with immunotherapy, corticosteroids, or nonsteroidal agents, the cat owner may opt for euthanasia. For the extra-special patient and client, immunosuppressive treatment may be beneficial, but this form of treatment is untested in the cat. An agent which might be effective is Chlorambucil (2-6 mg/m^2 BSA q24h). **William H. Miller, Jr., VMD, DACVD. Reprinted with permission from *Feline Health Topics* (July-September 1998 issue), a publication of the Cornell Feline Health Center, College of Veterinary Medicine, Ithaca, New York.**

NEOSPORA CANINUM NODULAR DERMATITIS

Since 1988, *Neospora caninum* has been recognized as a fatal protozoan parasite of dogs and should be suspected in any dogs under 1 year of age presenting with progressive ascending paralysis. Involvement of the neuromuscular system is the most common presentation but virtually all organs may be infected. Dermatitis associated with *N. caninum* infection has been briefly reported in two old dogs from the US. This report describes nodular dermatitis in a middle-aged dog from France.

A 6-year-old female Siberian Husky was presented to a local veterinarian for multiple raised lesions of the face and front legs. Saving the dog revealed numerous variably sized nodules scattered throughout the body. These nodules extended deep into the dermis and several were ulcerated. Bone marrow smears stained with May Grunwald-Giems (MGG) revealed a hypercellular marrow with medullary eosinophilia, erythroblastopenia and megakaryocytosis. Numerous extracellular *N. caninum*-like tachyzoites were observed by none could be identified within macrophages. Imprints from an intact nodule showed numerous hypersegmented neutrophils, a lesser number of macrophages and a few lymphocytes. Among this inflammatory population, free protozoal tachyzoites were seen. Macrophages with abundant foamy cytoplasm and containing ovoid to round *N. caninum*-like tachyzoites were observed in skin biopsies. This dog had experienced episodes of bloody diarrhea since she was a pup which had been successfully treated.

Although cutaneous involvement by coccidial organisms is uncommon in dogs, four apicomplexan parasites-*T. gondii, N. caninum, Caryospora* sp., and *Sarcocystis canis*-have been reported to cause dermatitis in dogs. Although *N. caninum* and *T. gondii* are difficult to distinguish by light microscopy, immunohistochemical tests and ultrastructural examination can aid diagnosis. Serologic examination is not always helpful because of dual infections.

The life cycle and source of postnatal infections of *N. caninum* are unknown. The parasite, however, can be transmitted congenitally for several generations and more than one infected litter may be born from the same infected bitch. Because *N. caninum* is structurally and biologically similar to *T. gondii*, a carnivore definitive host is considered to be involved in the life cycle of *N. caninum*. The definitive host for *N. caninum* is unknown. Anti-toxoplasmic drugs are effective in treating canine neosporosis. **–as reported in Veterinary News, Nov. 1998, Penn State University, University Park, PA.**

Editors note: the dog is now considered a definitive host of *N. caninum* in which sexual reproduction of the organism occurs.

WORTH NOTING

The first sporting event broadcast on radio was the 1920 World Series in Detroit. **KCR March 1999.**

FELINE ASTHMA

Feline asthma (i.e., allergic bronchitis) is the most common cause of coughing in cats. It is estimated that 1% of the general feline population is affected with this condition. Bronchial diseases are encountered more frequently in middle-aged and Siamese cats. When questioned, most owners will remark that they noted periodic coughing for several days to many months but that the attacks worsened only recently. The most common presenting complaint for cats with bronchial disease is coughing. These coughing attacks are typically paroxysmal; the cat will crouch low to the ground and extend its neck during a coughing attack. Coughs are dry and nonproductive and can last a few seconds to several minutes. Other signs associated with asthma include dyspnea, wheezing, exercise intolerance, and cyanosis. The condition often progresses, and attacks may become more frequent or severe. Owners may perceive their cat's retching as attempts to vomit and present asthmatic cats for persistent hairballs.

Optimal treatment of cats with allergic bronchial disease involves removing the offending allergen. If an owner has recently switched cat litter brands or changed to a scented brand, then reinstating the original brand is indicated. It may be necessary for an owner to stop using flea spray, carpet freshener, hair spray, certain household cleaners, or spray starch. Second-hand cigarette or chimney smoke, perfume, and cologne can also be triggers. Removing the cat from its household may be an appropriate therapeutic measure in refractory cases. Even after systematic elimination of the most common offenders, an allergen can still go undetected. Air purification systems that decrease allergens in the home environment are sometimes recommended.

Cats with mild or infrequent clinical signs often will not require therapy. Weight reduction may reduce signs in overweight patients. For cats in respiratory distress, initial treatment with supplemental oxygen and bronchodilators is indicated. Oxygen may be administrated via face mask or by placing the cat in an aquarium adapted for gas administration. Relatively stable patients that have two to three coughing episodes per day should be treated with corticosteroids. An initial dose of 20 mg/kg divided into 2 daily doses for 2 weeks often diminishes clinical signs quickly. As clinical signs improve, the dose should be tapered over 2-3 weeks. It is often possible to maintain a cat on 1.25 mg of prednisone once or twice a week.

If clinical signs worsen, bronchodilators should be added to the regimen. Bronchodilators can also be tried as initial therapy. The most common bronchodilator is theophylline. Current recommendations are for the use of sustained-release products. Administering theophylline at a dosage of 25 mg/kg once daily in the evening maintains therapeutic plasma concentrations. An alternative to theophylline is terbutaline, a $\hat{a}_2$-agonist, which is available in oral and injectable preparations. The current dosing recommendation is one-eighth to one-quarter of a 2.4-mg tablet twice daily, with a maximum dosage of 1.25 mg twice daily.

Cyproheptadine, an antihistamine that can block serotonin, has been advocated for the treatment of refractory cases or for cats that have intolerable side effects from bronchodilator therapy. A dosage of 2 mg orally twice daily is recommended. Bronchodilator therapy should be continued indefinitely in severe asthmatics but may be used intermittently in mild cases.

Stress to the animal should be kept to a minimum when dealing with diagnosed asthmatic patients. Minimal restraint should be used when vaccinating, drawing blood, and taking radiographs. Preoxygenation is essential before anesthesia. Patients should be monitored closely during anesthesia, including measurement of oxygen saturation and constant electrocardiographic evaluation. **M. Buss, Vet Technician 18: 1997. As reported in Veterinary News, Nov. 1998, Penn State University, University Park, PA.**

ACEPROMAZINE AND BUTORPHANOL FOR CANINE GI TRACT EXAMINATIONS

Currently, animals are sedated by combining low dosages of more than one drug, thus minimizing undesired cardiovascular and respiratory effects attributable to larger doses of any one drug. A popular sedative combination is acepromazine plus butorphanol. In dogs, this combination offers excellent restraint for radiographic procedures, and may prove useful for sedation during the positive-control upper gastrointestinal tract (UGIT) examination. Opioid agonists, such as morphine, delay gastrointestinal tract emptying by increasing GI sphincter tone and segmental intestinal tone. Butorphanol, an opioid agonist-antagonist, affects intestinal tone less than does morphine. Therefore, we suspected that butorphanol would alter GI function but not so severely as to preclude morphologic examinations of the GI tract. Thus, the objective of the study reported here was to determine whether the combination of acepromazine and butorphanol can be used for sedation of dogs during the UGIT examination for morphologic evaluation of the stomach and small intestine.

Six adult, healthy, heartworm-negative, mixed-breed dogs (2 females, 4 males), weighing 10 to 15 kg were studied. In a randomized crossover design study, weekly UGIT examinations were performed on each dog for 5 weeks after administration of normal saline solution (0.5 ml), xylazine (1.0 mg/kg of body weight), or a combination of ACE (0.1 mg/kg) and 1 of 3 doses of BUT (0.05, 0.2, 1.0 mg/kg). Gastrointestinal tract emptying time, GI motility, pulse, respiratory rate, and quality of restraint were assessed.

The ACE and BUT combination prolonged GI tract emptying times, decreased GI motility, and facilitated nonmanual restraint for duration of the examination. Although GI motility was decreased and total gastric emptying was prolonged, administration of ACE (0.1 mg/kg) plus BUT (0.05 mg/kg) allowed morphologic examination of the GI tract within 5 hours. Xylazine prolonged GI tract emptying, decreased GI motility, and provided good to excellent initial restraint. Xylazine and BUT (1.0 mg/kg) significantly decreased pulse and respiratory rate.

Nonmanual restraint techniques should be used as often as practical to reduce personnel exposure to radiation. Manual restraint is indicated when patients are uncooperative, UGIT examination is necessary, sedation will adversely affect interpretation of the examination, or sedation is contraindicated. Infrequently, sedation is required to perform the UGIT examination. The ideal sedative varies with the patient, examiner skills in nonmanual restraint, and suspected diagnosis. The combination of acepromazine (1.0 mg/kg) and butorphanol (0.05 mg/kg) may be used in dogs during the UGIT examination. Gastrointestinal motility will be adversely affected and TGE may be delayed, but this combination allows adequate morphologic examination of mechanical causes of obstruction in a reasonable amount of time (2 to 5 hours). The timing of radiographic examination should be adjusted individually on the basis of how quickly the contrast medium moves through the GI tract. Higher doses of butorphanol and xylazine did not result in statistically significant additional restraint and prohibitively decreased GI motility and transit time. Furthermore, we obtained several non-diagnostic examinations when xylazine or butorphanol (0.2 mg/kg) was used. Therefore, xylazine and butorphanol at these dosages should not be used for restraint during the UGIT examination. **Taken from: Scrivani, PV, et al. J Am Vet Res 59: 1227-1233, 1998. As reported in Vet Med, Vol. 5 Issue 1, Jan. 1999, Iowa State University, Ames, IA.**

WORTH NOTING

The Department of Agriculture has recently released a long awaited plan allowing and regulating the irradiation of meat by processors. These regulations cover only uncooked red meat and don't include meat products such as sausage and hot dogs. It could take years for legislation covering these products to pass and become working regulations. Irradiation of chicken was approved in 1992 but less than 1% of total output is presently irradiated. **KCR March 1999**.

HYPERTHERMIA FOR CANCER TREATMENT

Hyperthermia is the act of raising tissue temperature above 42° C (the level of a very high fever) for a set period of time to cause neoplastic cell death. It is known that high temperatures have a cytoxic effect, most likely due to protein alterations. There are many factors that can affect a tumor's response to hyperthermia. Blood perfusion, pH of the tissues, heat-shock proteins, thermoregulatory ability of the tumor, and the ability to repair sublethal thermal damage all can affect a tumor's response to hyperthermia.

Whole body as well as local hyperthermia has been used to treat cancer. Local hyperthermia can be supplied by microwave, ultrasound, ferromagnetic, and infrared methods to deliver heat. Heat can be applied superficially or interstitially by using various delivery devices.

The clinical application of hyperthermia as a single modality in the treatment of canine cancer has been disappointing. The best results have been seen when hyperthermia has been combined with other modalities, such as chemotherapy or radiation therapy. When hyperthermia and radiation therapy have been combined, an increased complete response rate has been seen compared to radiation therapy alone. Unfortunately, hyperthermia involves increased acute side effects.

The University of Illinois College of Veterinary Medicine will soon have the capability to use hyperthermia as a treatment modality for canine cancer. By utilizing advances in hyperthermia delivery systems and various imaging modalities such as CT scan or MRI, we hope to increase local control of tumors while minimizing side effects.

The study we are planning to conduct requires dogs with large tumor masses for evaluation. Financial subsidy for radiation therapy will be available to support case accrual. Please contact us for consultation regarding dogs with bulky carcinoma or sarcoma lesions. **–from John Hintermeister, DVM. *Illinois Veterinary Bulletin*, November, 1998. As reported in Florida Veterinary Scene, Vol 7, No 6, January-February 1999, University of Florida, Gainesville, FL.**

NEW FACULTY MEMBERS – VMRCVM

The Veterinary College at Virginia Tech has welcomed the following new members to the faculty:

Dr. Ernest Hovingh – assistant professor in Ruminant Health & Cooperative Extension position. Dr. Hovingh received his DVM from the University of Guelph in 1990 and his PhD in biostatistics and dairy health management from the University of Prince Edward Island in 1998.

Dr. Wallace Palmer – clinical instructor in Equine Field Services. Dr. Palmer received his BChE from the Georgia Institute of Technology in 1980 and his DVM from the University of Tennessee in 1992.

Dr. Daniel Boon – associate professor in clinical pathology, is a diplomate in veterinary pathology. Dr. Boon received his DVM and MS at Colorado State University. He came to Virginia Tech from United Veterinary Laboratories, Garden Grove, CA.

Dr. Xiang-Jin Meng – assistant professor in virology. He came to Virginia Tech from NIH in Bethesda, MD. He received his PhD at Iowa State University in immunobiology and his MD from Binzhou Medical College in Shandong, Peoples Republic of China.

Virginia-Maryland Regional College of Veterinary Medicine Extension Staff:

Dr. J.M. Bowen - Extension Specialist - Equine
Dr. C.T. Larsen - Extension Specialist - Avians
Dr. W. Dee Whittier - Extension Specialist - Cattle

K.C. Roberts, Editor
Tracy S. Shepherd, Production Manager of VIRGINIA VETERINARY NOTES

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