Effectively treating cats with FHM

Feline hemotrophic mycoplasmosis is a challenge to manage, but the right drugs and careful monitoring help cats recover.

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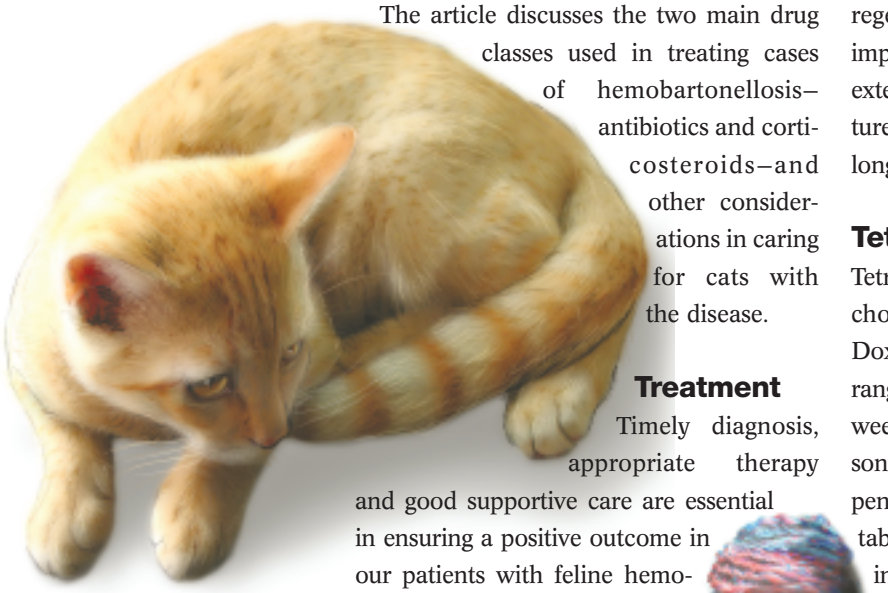
As evidenced by its recent name change, *Mycoplasma haemofelis,* formerly known as *Haemobartonella felis,* causes a disease in cats that is difficult to diagnose and a challenge to treat. Both the previous and new terminology are used in this article to explore the current treatments for the disease entity seen in feline patients.

The article discusses the two main drug classes used in treating cases of hemobartonellosis—antibiotics and corticosteroids—and other considerations in caring for cats with the disease.



Treatment

Timely diagnosis, appropriate therapy and good supportive care are essential in ensuring a positive outcome in our patients with feline hemotrophic mycoplasmosis (FHM), formerly known as feline infectious anemia. Without treatment, it is estimated that one-third of cats with acute hemobartonellosis ultimately die from severe anemia.[1]

Those cats that do recover without therapy often suffer from recurrent episodes and can remain chronically infected for months or even years, if not indefinitely.[2] While some of these untreated cats may appear clinically normal, they may also have a mild regenerative anemia for life. Thus, the importance of treating hemobartonellosis extends beyond the immediate clinical picture and becomes important for patients' long-term health and quality of life.

Tetracycline

Tetracycline antibiotics are the drugs of choice for treating hemobartonellosis. Doxycycline administered orally at a dose range of 2.5 to 5 mg/kg twice daily for three weeks is the preferred drug for several reasons.[1,3,4] First, it is available in an oral suspension that is preferable to tablets because tablets can lodge in a cat's esophagus, causing irritation and scarring that can result in esophageal stricture.[3] Furthermore, doxycycline only needs to be given twice

Illustration by Christian Hammer

a day, whereas other tetracyclines must be given three times a day. Finally, doxycycline tends to cause fewer gastrointestinal side effects than other tetracyclines. To further decrease the likelihood of gastrointestinal side effects, give doxycycline with food.[3] During oral antibiotic treatment, monitor Pets for fever, anorexia, vomiting and, although rare, liver toxicosis.

If doxycycline is not available or if the cat cannot tolerate it because of side effects, use a fluoroquinolone antibiotic (*e.g.,* enrofloxacin at a dose range of 2.5 to 5 mg/kg orally per day for three weeks). The full dose can be given at one time, or it can be divided into two doses per day. Caution is advised when using enrofloxacin in cats; do not exceed a total dose of 5 mg/kg daily because of the risk of ocular toxicosis, a rare idiosyncratic reaction characterized by mydriasis, retinal degeneration and blindness.

Corticosteroids

Killing the infectious agent is only half the battle in treating cats with FHM. A large part of the clinical syndrome is due to the immune-mediated destruction of infected red blood cells (RBCs) by erythrophagocytosis.[2,4,5] Therefore, treatment with a glucocorticoid, such as prednisone, helps suppress the immune response and slow the removal of the patient's RBCs.[1,4] (Administer prednisone at 1 to 2 mg/kg orally twice a day; decrease the dosage gradually as the packed cell volume [PCV] increases.) Frequently, steroids may be used because the immune response is such a large part of the disease. However, concurrent disease may preclude the use of steroids.

Remember to teach the Pet owner that while most steroids are well-tolerated by cats, they do cause immunosuppression and should be avoided in *M. haemofelis*-infected cats with heart disease, diabetes mellitus or concurrent infections.[3]

Blood transfusion

Because of the nature of an *M. haemofelis* infection, patients can experience a gradual or precipitous drop in hematocrit (some patients may experience both as the disease progresses), resulting in mild to life-threatening anemia. If a severe, rapid hemolytic crisis occurs (*e.g.*, PCV declines to less than 15 percent), a blood transfusion may be necessary. When considering a transfusion in a feline patient, remember that crossmatching should always be performed because anti-

Are Dogs at Risk?

Unlike cats, dogs rarely contract hemobartonellosis. The organism that causes disease in dogs, *Mycoplasma haemocanis (*formerly known as *Haemobartonella canis*), is not generally considered a problem except in dogs that have been splenectomized or have concurrent illness and splenic dysfunction, so consequently cannot filter infected red blood cells.[1] When feline patients share a home with a dog, educate the client that the disease affecting their cat cannot be transmitted to their dog. Explain that the two organisms, *Mycoplasma haemofelis* that affects cats and *M. haemocanis* that affects dogs, are distinct and do not cause infection in the other species.

1. Giger U. Hemobartonellosis. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia, Pa: WB Saunders Co, 2000:1799-1800.

bodies to foreign blood group antigens naturally occur in the feline species (see *Feline Blood Crossmatching*, page 40). If the critical nature of the case precludes time for crossmatching, give blood based on blood type, which can be determined using commercial kits. If a blood transfusion becomes a necessary part of the treatment plan, use the following volume guideline for feline patients: Administer a total volume of 4 to 5 mL/lb (8 to 12 mL/kg)[6] at a rate of 1 mL/min.

Examples:

- 6-lb cat: 30 mL given over 30 min
- 10-lb cat: 40 mL given over 40 min

Other considerations

Hemobartonellosis is an opportunistic infection; therefore, diagnosis and management of concurrent disease is critical to a positive outcome. Viral infections, abscesses, other systemic illnesses, trauma, stress and surgery are complicating factors. A significant number of cats with FHM are also feline leukemia virus (FeLV) positive, and it has been shown that concurrent infection with *M. haemofelis* and FeLV exacerbates the anemia.[1,7] Interestingly, simultaneous infection with feline immunodeficiency virus does not appear to worsen the anemia.[4]

When the patient is extremely debilitated and especially when other infections or disease processes are present, intravenous fluid administration can be life-saving. Consideration should also be given to administering glucose-rich fluids, particularly if the patient has been anorexic, is otherwise very ill or if the Pet is very young or underweight. Even with a low PCV, it is important to expand the circulating volume with crystalloid fluids so that vital organs receive an increased amount of the existing hemoglobin. Initial therapy for patients with FHM should begin with rehydration if it is indicated, as well as antibiotics and steroids where appropriate, and then the doctor should evaluate whether the patient needs a blood transfusion. Be sure to monitor for cardiac arrhythmias, syncope and dyspnea that can sometimes be seen as a result of the anemia. Once initial therapy has been started, if the patient continues in a critical state, consider referral to a facility that provides 24-hour monitoring during hospitalization.

Prognosis

The response to treatment of mycoplasmosis is largely how we monitor and predict the prognosis of our patients. Another indicator of improvement is appropriate an increase in PCV, which should be evaluated after about one week of therapy.[1] Also, it is important to keep in mind that none of

Feline Blood Crossmatching

Cats have three basic blood types denoted with an AB system. An individual cat may have blood type A, B or, very rarely, AB (*Table 1*). All cats except those with type AB blood have naturally occurring alloantibodies directed against the other blood type. Type B cats have high levels of these alloantibodies, which can cause strong agglutination and hemolysis of type A blood if these cats are transfused with it. Because of this, type B cats are in danger of an immediate transfusion reaction following the first transfusion of incompatible type A blood.

Type A cats have lower levels of alloantibodies to type B blood, which causes milder agglutination and hemolysis. So there are only minor transfusion reactions if type A cats receive type B blood; however, the survival time of these transfused cells is decreased.

Type AB cats can be safely transfused with type A or type B blood.

Neonatal isoerythrolysis can occur if type A or type AB kittens are born to type B queens. This occurs when newborn kittens nurse and ingest antibodies from the queen. This can be a cause of fading kitten syndrome.[1]

1. Bracker KE, Drellich S. Transfusion Reactions. *Compendium* 2005;27:500-512.

Table 1: Frequency of Occurrence for Feline Blood Types

	Percent of Cats with Blood Type		
Location	**A**	**B**	**AB**
Northeastern United States	99.7%	0.3%	0
Southeastern United States	98.5%	1.5%	0
Southwestern United States	97.4%	2.5%	0
West Coast United States	94.8%	4.7%	0.5%
United States (total)	98.1%	1.7%	0.2%
Australia (Brisbane)	73.3%	26.3%	0.4%
England	97%	3%	0
Germany	94%	6%	0
France	85%	15%	0
Japan	90%	10%	0

Table 2: Feline Breeds with Type B Blood

Breed	Percent of Breed with Type B Blood*
American Shorthair, Burmese, Ocicat, Oriental Shorthair	0
Maine Coon, Norwegian Forest	<5%
Abyssinian, Japanese Bobtail, Persian, Himalayan, Somali, Sphinx	10%-20%
Cornish Rex, Exotic Shorthair	20%-30%
British Shorthair, Devon Rex	40%-50%

*Type A percentages can be calculated by subtracting type B percentages from 100 percent.

the tetracyclines can clear the infection completely, so you may detect the organism on a blood smear in the face of an increasing PCV and improvement in the patient's condition. Remember that without treatment, approximately one-third of cats with acute hemobartonellosis will die.[1] If a timely diagnosis is made, cats generally respond well and quickly to treatment, and the prognosis for uncomplicated hemobartonellosis is good.[5] However, it is important to note that many cats remain carriers for the rest of their lives because the organism may not be completely eliminated from the blood even with treatment.[2,5] The good news is that these cats seldom become clinically ill once their PCVs have normalized and they have recovered.[1]

Prevention

While there is no vaccine to prevent infection with *M. haemofelis*, there are some steps that can decrease the risk of exposure. It has been shown that risk factors for FHM include positive status for FeLV, lack of vaccinations, history of cat-bite abscesses, age less than 4 years and an outdoor roaming status.[2,5] Hence, a thorough preventive-care schedule that includes testing for FeLV, appropriate vaccinations, neutering (thus reducing the propensity for fighting, which can result in cat bites) and keeping cats indoors could significantly reduce the risk of a feline Pet contracting hemobartonellosis. A good flea-control program with either Advantage™ (Bayer) or Frontline™ (Merial) can help protect cats from fleas that may carry the *M. haemofelis* organism.[5]

Client education is the key to gaining compliance with these basic steps that can help safeguard feline patients. Clinicians should also thoroughly screen all potential blood donors for hemobartonellosis because, as we know, once infected with *M. haemofelis,* a cat may always be a carrier.

Hemobartonellosis may be difficult to diagnose, but once a diagnosis is made, treatment of uncomplicated cases usually results in a positive outcome. Careful patient monitoring, appropriate drug therapy and vigilant supportive care are all integral to successfully completing the FHM treatment puzzle. Client education is paramount in preventing the disease, but it is also important in preventing the spread of the organism once discovered. All these factors allow us to maximize both the length and quality of life for our feline patients, thereby making life better for Pets and their families.

References

1. Harvey J. Hemobartonellosis. In: Tilley LP, Smith FWK Jr, eds. *The 5-Minute Veterinary Consult: Canine and Feline*. Baltimore, Md: Williams and Wilkins, 1997:648.
2. Breitschwerdt E. Hemobartonellosis. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia, Pa: WB Saunders Co, 2000:406-407.
3. Plumb DC. *Veterinary Drug Handbook*. 4th ed. Ames, Iowa: Blackwell Publishing Co, 2002:300-303, 309-312, 684-692, 779-783.
4. Giger U. Hemobartonellosis. In: Ettinger SJ, Feldman EC, eds. *Textbook of Veterinary Internal Medicine*. 5th ed. Philadelphia, Pa: WB Saunders Co, 2000:1799-1800.
5. Carney HC, England JJ. Feline hemobartonellosis. *Vet Clin North Am Small Anim Pract* 1993;23:79-90.
6. Phillips JD. *Banfield Blue Book*. Portland, Ore: Banfield, The Pet Hospital, 2003:15-16.
7. Messick JB. Hemotrophic mycoplasmas (hemoplasmas): a review and new insights into pathogenic potential. *Vet Clin Pathol* 2004;33:2-10.
8. Bracker KE, Drellich S. Transfusion Reactions. *Compendium* 2005;27:500-512.

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