

# O S Vitals S

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## Update on Ehrlichiosis

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Ehrlichial disease has been a long time recognized cause of illness in dogs in the Northeast. With the advent of in clinic snap testing, screening for *Ehrlichia canis* has become routine along with heartworm and Lyme testing. Although, *E. canis* has been the most recognized causative agent of clinical ehrlichiosis in New England, disease has been associated with other species including *E. equi* and *E. risticii*. In our hospital, we have noticed an increase in *E. equi* in patients presenting with a variety of symptoms. The majority of these animals had been previously snap tested or serologically tested negative for *E. canis*. Ehrlichial disease has also been a newly recognized entity in cats. Although certainly not as common as canine counterparts, we have diagnosed cats with ehrlichial disease presenting with primarily hematologic changes. The purpose of this article is to briefly review Ehrlichial disease in dogs and cats, and to present a few clinical cases we have seen over the last year.

The various Ehrlichia species have been largely grouped based upon the cell type they primarily infect; although the majority of species will cross infect cells. A newer classification scheme has been introduced which now classifies some organisms that were previously in Ehrlichia (such as *E. equi*) in the genus *Anaplasma*. *E. equi* by this classification system is now referred to as *A. phagocytophila*, however, for the purpose of this article it will still be discussed as *E. equi*. Ehrlichia is a gram negative organism which is an obligate intracellular parasite spread by ticks. The most common ticks implicated in transmission include the brown dog tick and *Ixodes* species. Transmission is via a tick bite on the host after which the organisms replicate within mononuclear cells and can then spread throughout the body. The clinical signs are for the most part caused by immunologic and inflammatory reactions triggered by the parasite. The various clinical presentations have been technically classified within the subacute, acute, and chronic phases. While the transmission in cats as not as clearly determined, it is felt to be very similar to dogs.

Clinical signs in dogs are often non-specific and

include lethargy, fever, inappetance, depression, and weight loss. Other clinical signs can include lymphadenopathy, bleeding tendencies from thrombocytopenia/thrombocytopenia, anterior uveitis, chorioretinitis, neurologic signs due to encephalitis, polymyositis, and polyarthritis. Changes on screening blood work can include thrombocytopenia, anemia, leukopenia or leukocytosis, lymphocytosis, and hyperglobulinemia. Chronic forms of ehrlichiosis can result in pancytopenia, hyperviscosity syndrome, or glomerulonephritis and nephrotic syndrome. However, some animals may have normal blood work.

Cats can also have variable and nonspecific presenting signs such as lethargy, inappetance, weight loss, and hyperesthesia. A recent review on clinical signs in cats in JVIM (Nov/Dec 2002), found a variety of symptoms including lethargy, fever, splenomegaly, polyarthropathy, and weight loss. Changes on blood work included anemia, thrombocytopenia, leukopenia, and hyperglobulinemia. Some cats had positive ANA and autoagglutination evident as well. Most cats that have been described with natural infection have been young outdoor cats. However, the possibility of Ehrlichial disease should be included in the differential of cats presenting with any of the above symptoms especially as it's presentation can often appear similar to immune mediated disease.

Diagnosis of Ehrlichial disease is predominantly by serologic screening. In the New England area, it is highly recommended to test for the three most common species in our area *E. canis*, *E. equi*, and *E. risticii*. Previous recommendations in cats were to screen for *E. canis* and *E. risticii* as the presumed causative agents cross-reacted with these species. Recent recommendations are to include *E. equi* in the spectrum of testing, as more cats are being tested positive with this species alone. When screening for Ehrlichial disease, it is important to keep in mind that some animals may not have positive titers until 28 days after infection. Therefore, if ehrlichial disease is highly suspected, convalescent titers 4-6 weeks after initial serology is recommended. Affected animals may have persistently elevated titers months to years after successful

## *A Visual Perspective*

### **Indolent Ulcers: Why won't they heal??**

Most veterinarians have, at some point in their career, experienced the frustration of chronic, superficial, non-healing corneal ulcers (also called indolent ulcer, Boxer ulcer, or corneal erosion). These ulcers are somewhat classic in their appearance; they usually occur in middle-aged to older dogs, are superficial with adjacent undermining of epithelium, are slow to resolve, and despite their chronicity, often generate little to no vascular response. Although any breed may be affected, there appears to be a predilection for certain breeds besides the Boxer, namely the Corgi, Golden Retriever, Miniature Poodle, and Samoyed.

The most important thing to remember about these ulcers is that the delay in healing is due to a malfunction in the basal epithelial cells and their basement membrane; new epithelium is produced but cannot "stick". This mechanical/ chemical defect is the reason changing from one antibiotic to another offers no solution. Topical antibiotics function only as infection prophylaxis. While a variety of topical agents (autologous serum, Adequan/ artificial tears, fibronectin, hypertonic saline) have been used over the years, the most consistent response has been to mechanical debridement and keratotomy. Some particularly stubborn cases may need a keratectomy to achieve permanent epithelial adhesion. Nictitans flaps can be effective, but should be left in place for a minimum of 2 weeks.

Achieving rapid resolution of these ulcers depends on the appropriate diagnosis, addressing any co-factors such as tear film abnormalities or adnexal disorders, good client communication, and a combination of surgical and medical management.

If I can be of assistance with any of your frustrating ophthalmic cases, please feel free to call me. Consultations are available Monday through Thursday.

- Marcia Aubin DVM, MS, DACVO

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Initially MRI will be available one day per week with additional days to follow. As soon as we have a firm start date, we will contact you via letter. Meanwhile, if you have any questions regarding the service please feel free to call and speak with Dr. Sue Newell.

## **Radiology Film Interpretation**

*with*

Sue Newell DVM, Diplomate of the American  
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treatment and eradication of the disease. Recently, PCR technology has been developed for detecting Ehrlichial disease. This tests for organism DNA using primers and requires good quality control on the part of the lab for evaluation. This is a more sensitive method and has the advantage over serology in distinguishing between persistent chronic infection and persistently elevated titers after successful treatment. PCR should be evaluated in conjunction with serology per the consensus statement of the American College of Veterinary Internal Medicine Infectious Disease Study Group.<sup>1</sup>

The recommended treatment for Ehrlichial disease is with a 3-4 week course of doxycycline or tetracycline at 5-10mg/kg/day. Some animals may require longer treatment periods if chronic disease is suspected. Imidocarb dipropionate is an aromatic diamidine that has been used alone or in combination with doxycycline. Most recent studies have shown no increase in efficacy with imidocarb. It can be useful in the treatment of persistent or resistant infections at a dose of 5mg/kg IM with a repeat injection in two weeks. Chloramphenicol has also been shown to be effective in the treatment of Ehrlichiosis particularly in puppies to avoid tooth discoloration. While the fluoroquinolones have been shown to be useful in treating Rocky Mountain Spotted Fever (RMSF), they are NOT effective in treating Ehrlichial disease. Because the hematologic changes are suspected to have a partial immune mediated pathogenesis, corticosteroids may also be indicated in the first few weeks of treatment. If animals are acutely and seriously affected, they may require ancillary supportive care as well.

Resolution of hematologic and clinical signs should occur within 1-2 weeks of appropriate therapy. If there is lack of improvement, the diagnosis should be re-evaluated. In most animals serology should become negative within 6-9 months. However, titers may be persistently elevated even with clinical resolution of disease. PCR can be helpful in distinguishing persistent antibody titers from active infection but false negatives and positives are still possible. In animals in which clinical and hematologic signs have resolved, further investigation likely does not need to be initiated.

In conclusion, it is advised that animals presenting with any clinical signs suggestive of Ehrlichial disease have a full Ehrlichial panel performed to fully rule out other less commonly recognized species. Convalescent titers should be performed in high suspect cases, or animals responding to a course of doxycycline to confirm a presumptive diagnosis. The use of convalescent titers and PCR can be employed to follow treatment and to evaluate for chronic illness.

#### CASE 1

“Murphy”, 6 year MC Golden Retriever

**Presentation:** One-week history of intermittent fevers (greater than 103), lethargy, inappetance, and stiff gait

**Previous Blood work:** E. canis negative on snap test, anemia (32%), thrombocytopenia (74,000)

**Physical exam:** Fever on presentation of 103.5, generalized

peripheral lymphadenopathy, pale pink mucous membranes.  
**Clinical Pathology findings:** anemia with mild autoagglutination, thrombocytopenia, mild elevation in liver values: ALP 221 (20-150)

**Differential diagnosis:** Neoplasia (lymphoma), autoimmune disease, infectious disease (RMSF, Ehrlichiosis)

**Other diagnostics:** Thoracic radiographs and abdominal ultrasound – within normal limits; Lymph node biopsy – reactive with plasmacytosis; bone marrow – suggestive of immune stimulation with normal myeloid, erythroid, and megakaryocyte lines; E. canis – negative; E. risticii – negative; E. equi - positive at 1:640

**Treatment:** Doxycycline 5mg/kg BID for 3 weeks, a tapering course of prednisone

**Follow up:** Resolution of hematologic changes, resolution of lymphadenopathy, and stiffness within 10 days of therapy.

#### CASE 2

“Tye”, 13 year MC Lhasa Apso

**Presentation:** Several week history of non-regenerative anemia progressing to pancytopenia, lethargy, inappetance, weakness; Previous history of elevated liver values and PU/PD

**Previous work up:** Thoracic radiographs – WNL; Abdominal ultrasound – adrenal mass on L adrenal; enlarged hyperechoic liver; ACTH stimulation test consistent with hyperadrenocorticism

**Physical exam:** Pale mucous membranes, weakness, tachycardia, thin body condition

Clinical Pathology findings: Pancytopenia, mild elevations in liver values, isosthenuria

**Differential diagnosis:** Paraneoplastic (lymphoma, other), immune mediated, infectious (rickettsial, ehrlichiosis), primary bone marrow disorder (myelodysplasia, red cell aplasia)

**Other diagnostics:** E. canis – neg; E. risticii – neg; RMSF – neg; E. equi – 1:3200; bone marrow – marrow necrosis suggestive of vasculitis, hypoxia, or drug reaction

**Treatment:** Prednisone at immunosuppressive doses along with doxycycline for 3 weeks.

Follow up: All cell lines returned to normal with the exception of the red cell line which remained non-regenerative. Additional blood transfusions required as PCV decreased and Tye became clinical for anemia. Ehrlichial infection secondary to chronic immunosuppression from hyperadrenocorticism was suspected. Due to changes seen on bone marrow examination chronic infection was considered likely with potential non-reversible bone marrow suppression/damage. Tye was euthanized due to failure to respond to therapy completely and need for multiple transfusions.

References: <sup>1</sup> Neer TM, Breitschwerdt EB, Green RT, et al. Consensus statement on ehrlichial disease of small animals from the infectious disease study group of the ACVIM. J Vet Intern Med 2002; 16(3):309-15.

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***Staff Spotlight***

**Marcia Aubin DVM, MS, DACVO**



It is with great pleasure that we welcome Dr. Marcia Aubin to Ocean State Veterinary Specialists as our new ophthalmology specialist. Dr. Aubin received her D.V.M. from Iowa State University in 1988 and then worked in a variety of general practices. From 1998 through 2001, she attended Colorado State University where she completed her Master's in Clinical Science and her Ophthalmology Residency. Prior to joining OSVS, she was staff ophthalmologist for a large specialty referral hospital in northern California. She became board certified in Ophthalmology in 2003. Dr. Aubin offers a full array of ophthalmic services, including cataract surgery via phacoemulsification, intraocular lens implantation, and cryosurgery and is anxious to assist you with your ophthalmic cases.