**Inflammatory Brain Disease: Integrative Therapy**

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**Disclosure:**

 Roger M Clemmons teaches at the Chi Institute in Reddick, FL, but has no other financial relationship with any company mentioned in this article.

**Objectives:**

 1. Attendees will be able to understand the differential diagnosis of inflammatory brain disease.

 2. Attendees will be able to assess therapeutic methods to help control CNS inflammation.

Like Cancer, Inflammatory Brain Diseases are on the rise. Twenty years ago, it was rare to diagnose meningomyelitis and most of these were secondary to canine distemper virus with the remainder being due to toxoplasmosis. Today, it is almost impossible to deal with animals with neck pain and not be suspicious of meningomyelitis. These represent a complex group of diseases which can be characterized partly based upon the anatomic structures of the central nervous system which are affected. As such, they can be classified as the meningitides, encephalitides or the myelitides or various combinations thereof. Some of these conditions occur secondary to infectious causes, but many have no discernible etiologic agent. Of these, Granulomatous Meningoencephalitis (GME) and Meningoencephalitis of Unknown Cause (MUC) are the most common. The main difference relates to prognosis, since true cases of GME usually progress rapidly and lead to death within 3-6 months even with aggressive therapy. On the other hand, MUC can be treated (if not cured) for extended periods of time.

 The clinical signs of meningomyelitis are, generally, neck pain and asymmetrical neurologic deficits. The deficits depend upon which pathways are involved in the disease process. The signs are usually progressive, but may develop acutely. In dogs and cats, the causes of meningomyelitis are, in order of likelihood, viral, inflammatory, protozoal, fungal, rickettsial and bacterial diseases. The viral disease most commonly seen in dogs is canine distemper (even in vaccinated dogs). In cats, feline leukemia virus (FeLV), feline infectious peritonitis (FIP) and feline immunodeficiency virus (FIV) are the most common viral infections. Toxoplasmosis can occur in both dogs and cats, while dog also may develop *Neospora caninum* infections. Aspergillosis is not uncommon in dogs, while cryptococcosis is more common in cats. Cats do not appear to have rickettsial diseases, but dogs have been shown to develop meningomyelitis from both ehrlichiosis and Rocky Mountain spotted fever. Titers for these agents should be performed on the serum and/or CSF when presented with meningomyelitis.

 The diagnosis is made on CSF tap and analysis. Generally, we approach animals with neck pain and quadriparesis by performing a minimum data base including a CBC, chemistry profile, urinalysis and appropriate radiographs. With the CBC, we run plasma fibrinogen levels. This is a crude estimate of systemic inflammation, but a valuable tool in assessing the potential for meningomyelitis. It may be the only abnormality noted in the CBC. Once the minimal data base is evaluated, we proceed with anesthesia and CSF tap. While this is being processed, spinal radiographs are taken. If the CSF indicates inflammation by increase in cells and protein and the survey radiographs do not demonstrate significant findings, we then treat the inflammation rather than proceed with myelography. Based upon the response to therapy, we reassess the need for further tests. CSF titers are submitted for the relevant infectious agents providing confirmation of the specific disease causing organism. In those cases where a specific disease causing organism can be found, the treatment is adjusted appropriately. When no organism is found, the tentative diagnosis of inflammatory meningomyelitis is made. Many newer forms of meningomyelitis are now recognized including steroid-responsive meningomyelitis. This is usually associated with an increase in blood vessel fragility and may lead to an apparently blood-contaminated CSF tap. On examination, however, there is a marked increase in non-degenerative neutrophils in the CSF.

 As in beagles with necrotizing vasculitis (beagle neck pain syndrome), many of patients with steroid-responsive meningomyelitis have elevations in alpha 2 globulins on serum electrophoresis. Steroid-responsive meningomyelitis probably represents a form of vasculitis which results in inflammation in the CNS. Conventional therapy with corticosteroids will not always resolve this condition, since steroids only suppress the symptoms of the disease. Although some dogs recover from this disease following corticosteroid management, many would probably benefit from alternative therapy. Conventional therapy involves giving prednisolone at 1 mg/kg/day in three divided doses. Once the signs resolve (usually within 72 hours), the dosage is reduced to twice a day. This is further reduced to daily medication in the morning and, finally, to alternate day therapy. We find that many patients will benefit from anti-oxidant therapy, including vitamin E, vitamin C and selenium. Additional medications of benefit include omega-3-fatty acids, ginkgo biloba extract and green tea. When pain is present, garlic, ginger and feverfew may help reduce the inflammation without causing additional gastrointestinal signs. Some patients will be relieved by the alternative medication, reducing or replacing the corticosteroid.

There is no clinical or diagnostic procedure (short of biopsy and necropsy) which can differentiate between GME and MUC. MRI examinations and examination of CSF confirm the presence of inflammatory brain disease, but do not provide a specific diagnosis. However, clinical response to therapy may help lead to a distinction, since MUC cases usually do well on medication. Anti-inflammatory medications are the mainstay of therapy; however, steroid sparing and replacement with alternative measures is highly desirable. While the experience of differing clinicians varies, steroid sparing medications like azathioprine, cyclosporine, and cytarabine are important to help reduce inflammation and steroid use. Combined with alternate day prednisolone therapy, these medications can help control MUC for years.

 ***TCM Diagnosis and Treatment***TCM Diagnosis and Treatment**:** Meningitis represent invasion of wind, heat and damp like the phlegm-fire syndrome of sudden seizures. There may be agitation, insomnia, or barking at night. There may be constipation or cough. The tongue is red or purple with a yellow, greasy coating. The pulse is rapid (heat), wiry (liver) and slippery (damp). Treatment principles are to clear the liver, drain the heat, transform phlegm and open the orifices. You can use *Di Tan Tang* (herbal equivalent of phenobarbital if seizures) and *Long Dan Xie Gan Tang (Snake and Dragon)*. The former formula stops the seizures and the latter clears the heat, soothes the liver, and moves the damp. Acupuncture point selection includes LI-4, LI-11, GV-14, GB-20, GV-20, GV-21, SP-3, LIV-3, KID-3, TH-5 and SI-3.

 Additional medication such as a modern TCVM herbal formula (Damp Heat Mind Formula, Mayway, CA) and a special therapeutic vitamin supplement (AntioxQ-CB, Westlab Pharmacy, Gainesville, FL 800-4WESTLA) can also help and sometimes replace the need for conventional anti-inflammatory medications.