

## **Owner Information Sheet – *Inflammatory brain disease***

### **Background**

Inflammation of the brain and its covering membranes (the meninges) is called meningoencephalitis. This is most commonly an 'immune mediated' or 'auto-immune' condition in dogs, however infections can be responsible (e.g. parasites such as Neospora) although uncommon. Some dogs will also have inflammation of their spinal cord (meningomyelitis) in addition to, or instead of, their brain.

### **Cause**

The trigger for immune-mediated brain disease is unknown in the majority of dogs. It is most common in young to middle aged, female, small (terrier) breed dogs. However, animals of any age, sex and breed can be affected. A complex interaction of genetics and the animal's environment probably contribute to the development of this condition.

Some specific types of inflammatory brain disease have been described in dogs based upon the distribution of inflammation and the types of inflammatory cell involved – these include 'granulomatous meningoencephalitis' (GME), 'necrotising meningoencephalitis' (NME), 'eosinophilic encephalitis' (EE) and 'necrotising leukoencephalitis' (NLE). Ultimately definitive diagnosis can only be made by examining brain tissue under a microscope, via a biopsy. However, brain biopsy is very invasive and a potentially risky procedure. The treatment for these conditions is the same, therefore we do not routinely recommend biopsy in dogs and these conditions are all grouped under the broad term of meningoencephalitis of unknown origin (MUO).

### **Clinical signs (symptoms)**

The clinical signs caused by MUO are varied and depend upon which area of the brain is inflamed. Some animals will have seizures, whilst others will show blindness, disorientation, a head tilt, wobbliness, loss of balance, walk in circles, weakness, change in personality and behaviour, weakness of the face or difficulty swallowing. Many animals will show a combination of these signs. The clinical signs can be sudden and severe in onset, or they can be slow and insidious in their progression.

### **Diagnosis**

As previously mentioned, obtaining a brain biopsy is very invasive and a potentially risky procedure, so we do not normally recommend this in dogs. However, less invasive diagnostic tests can be performed to achieve a presumptive diagnosis of MUO. These tests include magnetic resonance imaging (MRI) of the brain and collection of cerebrospinal fluid (CSF) to confirm the presence of inflammation. Tests can then be performed on the blood and/or CSF to exclude an infectious cause of the inflammation observed.

As the changes seen on MRI and CSF can be non-specific, with certain types of cancer resulting in similar changes, your veterinary neurologist may recommend ruling out cancer elsewhere in the body using scans (e.g. ultrasound or CT) +/- biopsies.

## Treatment

The mainstay of treatment for MUO involves suppression of the immune system to stop it inappropriately attacking the brain. This usually involves baseline treatment with high doses of a corticosteroid such as prednisolone. The dose of steroid is reduced slowly over the course of several months to achieve a lowest effective dose. Unfortunately, side effects are commonly seen with steroid use. These are dose-dependent and include increased thirst and hunger (consequently increased urination and weight gain), lethargy, panting, muscle atrophy, and increased risk of infections (e.g. respiratory and urinary).

The use of additional medications is often advised in the treatment of MUO as these may result in a better response to treatment in some cases. We commonly use a drug called cytosine arabinoside (cytarabine) as an injection, when patients are hospitalised. Other medications, such as cyclosporine and azathioprine, can be given at home. Your veterinary neurologist will discuss which medications would be most appropriate to treat your individual pet's condition and what side effects may be expected.

## Prognosis

The prognosis for MUO is highly variable. A good initial response to treatment may indicate a more favourable prognosis. It is possible for animals to enter full or partial remission from the disease and maintain a good quality of life for many months or years. Unfortunately, some animals may not respond to treatment or may show frequent relapses of their clinical signs and the prognosis in these cases can be guarded to poor. There is no way of knowing how an individual animal will respond to treatment at the time of diagnosis. Treatment will usually be needed long term and possibly for life.

If you have any concerns about your dog or their treatment, do not hesitate to contact your vet.

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