

Feline Epilepsy and Management

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Epilepsy is defined as recurrent seizures over a chronic period of time. Epilepsy is not a specific disease, but a clinical sign. Over the years there have been attempts to categorize seizures into specific categories. Basically, idiopathic epilepsy is considered primary epilepsy- there is no identifiable brain abnormality or specific etiology found when the patient is worked up. Symptomatic epilepsy is considered secondary epilepsy- there is an identifiable lesion or specific etiology found that is causing the seizures.

Feline seizures present in a variety of ways. There are multiple forms and severity of seizures in the cat.

- Tonic-clonic/ grand mal/ generalized seizures: Cats have a loss of consciousness, they are recumbent, have limb paddling, opisthotonic posture, muscle twitching, mouth chomping, piloerection, mydriatic pupils, +/- urination, defecation, and vocalization
- Clonic seizures: +/- loss of consciousness, jump violently, aggressive, agitated, facial twitching, piloerection, kicking, chewing, +/- urination, defecation, and vocalization
- Simple partial seizures: Cats have a normal mentation but have unilateral motor signs such as limb movements or facial twitching, head shaking, mydriatic pupils, +/- urination, defecation and vocalization
- Complex partial/ psychomotor seizures: Cats have altered consciousness, behavioral and motor signs, turning of head, chewing, +/- ataxia, episodes of aggression or fear, repetitive limb motions, frantic running, +/- aimless movements

Simple partial and complex partial seizures can progress to generalized seizures over time.

There are also disorders in the cat that can be mistaken for seizures. Syncopal episodes, narcolepsy, sleep movements and behavioral disease are a few examples.

The causes of feline epilepsy can be broken down into 3 categories; intra-cranial, extra-cranial and idiopathic. Generally most cats with intra-cranial disease will have abnormalities on the neurological exam, unlike cats with idiopathic epilepsy that will have a normal neurological exam. Cats with extra-cranial disease will have abnormalities on the metabolic workup +/- the neurological exam, unlike cats with idiopathic epilepsy that will have a normal metabolic workup and exam.

Intra-cranial Disease:

Degenerative/ Congenital/ Anomalous: storage diseases, hydrocephalus

Neoplasia: primary or metastatic

Inflammatory/ Infectious: cryptococcosis, toxoplasmosis, FELV, FIV, FIP, other unknown viral diseases, unknown meningoencephalitis

Traumatic

Vascular: ischemic encephalopathy, hypertension, thromboembolic disease

Extra-cranial Disease:

Metabolic: hepatic encephalopathy, uremia, hypoglycemia

Toxins: organophosphates, ethylene glycol, lead

Nutritional: thiamine deficiency

Idiopathic Epilepsy:

There are many slightly different definitions for idiopathic epilepsy. There are some who believe it is recurrent seizures of unknown origin and others who believe it is defined as epilepsy without underlying brain disease and presumed to be genetic in origin. 0-59% of epileptic cats have been reported to have idiopathic epilepsy in the literature. The papers with 0% have defined idiopathic epilepsy as having a genetic basis. Other papers that report percentages up to 59% have defined idiopathic epilepsy as recurrent seizures of unknown origin that have negative diagnostic workups and normal neurological exam.

The most common cause of feline seizures that I see here at the Veterinary Specialty Hospital includes idiopathic, neoplasia, cryptococcosis, and suspected vascular accidents.

Cats with idiopathic epilepsy have a normal physical and neurological exam and a normal or negative diagnostic workup. They remain normal in between seizures. In some cats the seizures have been present for years.

Neoplasia:

Intra-cranial neoplasia is a common cause of seizures in cats. The most common primary neoplasia is a meningioma. These can occur singly or can be multiple. They usually occur in older cats and almost all cats will have other neurological signs besides the seizures. Primary CNS lymphosarcoma usually affects young to middle aged cats. Other less commonly seen primary tumors include choroid plexus, pituitary, and glial tumors. The most common secondary or metastatic neoplasia includes lymphosarcoma, mammary adenocarcinoma, and hemangiosarcoma.

Cryptococcus:

San Diego has a high prevalence of cryptococcosis in cats compared to other regions. Cats with crypto can present with many neurological signs including spinal pain, ataxia, paresis, circling, nystagmus, head tilt, obtundation, and seizures. Some cats will have a history of upper respiratory tract infection that was not responsive to antibiotics. Some cats will have cutaneous or pulmonary nodules/lesions as well.

Vascular accidents:

Vascular accidents can also cause seizures. Cerebral infarction can be idiopathic or can be secondary to hypertension or thromboembolic disease. These cats are generally older and many have concurrent neurological signs. There are also reports of feline ischemic encephalopathy that have thrombosis or vasospasm of the middle cerebral artery. Multiple causative factors may be involved. Young adult cats are most commonly affected.

Diagnostics:

The general diagnostic workup for cats with epilepsy consists of a CBC, Chemistry profile, urinalysis, +/- T4 to screen for metabolic disorders. Pre and post prandial bile acids are performed in cats with a suspicion of hepatic encephalopathy or portosystemic shunt. The standard infectious disease profile consists of tests for FELV, FIV, FIP, toxoplasmosis and most importantly a cryptococcosis titer. Thoracic radiographs are taken in those cats that need to be screened for metastatic disease. A systolic blood pressure is warranted in cats where a vascular accident is suspected. Finally, an MRI of the brain +/- a CSF analysis is recommended to evaluate seizing cats when intra-cranial disease is suspected.

Treatment:

Treatment for feline epilepsy depends on the underlying etiology. The primary treatment for idiopathic feline epilepsy is phenobarbital. Diazepam, potassium bromide, Keppra and gabapentin can also be used in the cat. Side effects of these medications need to be considered when choosing an anti-convulsant. Some of the newer anti-convulsants have not been used much in the cat, so information regarding effectiveness and side effects is limited.

Phenobarbital is very effective at controlling seizures in the cat. This is my drug of choice for feline epilepsy. The dosage can be based on the size of the cat or you can start at 2 mg/kg PO BID. Small cats get 7.5 mg PO BID, medium cats get 15 mg PO BID, and the large cats get 22 mg PO BID. Serum blood levels (in a RTT- no serum separator) should be evaluated along with a current body weight, 2-3 weeks after initiating therapy. The therapeutic range is 20-35 ug/ml. Lethargy and ataxia will usually be seen if cats have a serum blood level over 40 ug/ml. The most common side effects are sedation, ataxia, and polyphagia/weight gain.

Diazepam (Valium) can be used for feline epilepsy and can be added to phenobarbital in those cats that are still seizing frequently with an adequate phenobarbital blood level. Diazepam can be used at 0.5-1.0 mg/kg PO BID. The adverse effects include paradoxical excitation, polyphagia, and rarely hepatic necrosis. It is recommended to check liver enzymes 1 week and 1 month after starting diazepam.

Potassium bromide (KBr) is also available for seizure control. I do not use this drug in cats due to the potential of eosinophilic pneumonitis (bronchial asthma) which can be fatal if the drug is not discontinued. Coughing has been reported in 42-50% of cats treated with bromide. The dose of KBr is 20-35 mg/kg PO SID and a serum blood level

should be obtained 3 weeks after starting this medication in the cat. The therapeutic range is 1-3 mg/ml. Thoracic radiographs should be obtained prior to starting therapy.

Two other anti-convulsants that are primarily third line anti-convulsant medications used in dogs but can also be used in the cat are levetiracetam (Keppra) and gabapentin (Neurontin). The dose of Keppra is 10 mg/kg PO BID-TID and the side effects may include sedation and possible inappetance. The dose of gabapentin is 10-30 mg/kg PO BID-TID. The main side effect is sedation. The liquid form (50 mg/ml) is made with xylitol and is therefore not recommended for use in cats. Gabapentin needs to be compounded to the appropriate amount in cats.