

SEIZURES (CONVULSIONS, STATUS EPILEPTICUS) IN CATS

BASICS

OVERVIEW

- “Seizures” are periods of uncontrolled electrical activity in the brain (also known as “convulsions”); “status epilepticus” is repeated or prolonged seizure activity
- “Epilepsy”—disorder characterized by recurring seizures that originate from the brain
- “Idiopathic epilepsy”—epilepsy of unknown cause; syndrome that involves only epilepsy, with no demonstrable underlying brain lesion or other nervous system signs; rare in cats
- “Symptomatic epilepsy”—syndrome in which epileptic seizures are the result of identifiable, structural brain lesions; frequent in cats
- “Probably symptomatic epilepsy”—when symptomatic epilepsy is suspected, but a lesion cannot be demonstrated; frequent in cats
- Cluster seizures—more than one seizure in 24 hours
- Status epilepticus—continuous seizure activity, or seizures repeated at brief intervals without complete recovery between seizures; status epilepticus can be localized (known as “focal” or “non convulsive” status epilepticus) or generalized (known as “convulsive status epilepticus”)—convulsive status epilepticus is a life-threatening medical emergency

SIGNALMENT/DESCRIPTION of ANIMAL

Species

- Cats

SIGNS/OBSERVED CHANGES in the ANIMAL

- Localized (focal) seizures with/without secondary generalization are the most frequent—movements of facial muscles predominate, such as twitches of eyelids, whiskers and ears; it may be associated with whole body trembling/shaking, leg motions, hair standing up (known as “piloerection”), dilated pupils, frantic running, and colliding with objects
- Generalized tonic-clonic motor seizures—symmetrical sustained, repetitive (known as “tonic-clonic”) contractions of leg muscles on both sides of the body and movement of the head up toward the back; often associated with salivation, urination, and defecation—by the time of admission to a veterinary hospital, the gross motor activity may have stopped, but twitching of the lids and body/limb jerks still may be present
- Injury is frequent—biting of tongue, torn nails or claws
- Mental status, reflexes, and menace response may be abnormal
- Other signs and physical examination findings vary, based on underlying cause of the seizures and the severity of the seizures

CAUSES

- Pattern of seizures (such as age of cat at onset of seizure activity, type and frequency of seizures) is the most important factor in determining possible causes

Extracranial Cause (disorder outside of the head, leading to seizure activity)

- Metabolic disorder—low blood glucose or sugar (known as “hypoglycemia”), such as from insulin overdose; low calcium levels in the blood (known as “hypocalcemia”) following surgery to remove the thyroid gland (known as “thyroidectomy”); high blood pressure (hypertension) secondary to kidney transplant; nervous system disorder caused by accumulation of ammonia in the system due to inability of the liver to rid the body of ammonia (known as “hepatic encephalopathy”)
- Poisons

Intracranial Cause (disorder inside of the head, leading to seizure activity)

- Anatomic or structural disorder—congenital (present at birth) malformation
- Metabolic disorder—storage diseases (inherited metabolic diseases in which harmful levels of materials accumulate in the body’s cells and tissues)
- Tumors or cancer—meningioma, glioma, lymphoma
- Inflammatory infectious disease—viral diseases (such as feline infectious peritonitis [FIP]), toxoplasmosis, cryptococcosis
- Trauma
- Poisons—insecticides (such as organochlorines, pyrethrins and pyrethroids); chemotherapeutic drug, chlorambucil, used in lymphoma treatment
- Blood vessel or circulatory disorders—red-blood cell (RBC) count above the normal ranges, characterized by the uncontrolled, but orderly production of excessive numbers of mature red-blood cells by the bone marrow (known as “polycythemia vera”) leading to sludging of the blood (known as “hyperviscosity”); a disorder characterized by lack of blood flow to part of the brain, caused by migration of *Cuterebra* larva (known as “feline ischemic encephalopathy secondary to *Cuterebra* larva”)

RISK FACTORS

- Any brain lesion
- Treatment with chlorambucil, a chemotherapeutic drug
- Kidney failure
- Diabetes mellitus (“sugar diabetes”)

TREATMENT

HEALTH CARE

- Outpatient—isolated recurrent seizures in an otherwise healthy animal
- Inpatient—cluster seizures (more than one seizure in 24 hours) and status epilepticus (repeated or prolonged seizure activity)
- Constant medical supervision
- An intravenous (IV) catheter will be established to allow for drug and fluid administration
- Blood should be drawn for rapid measurement of blood gases, glucose, calcium, and levels of anti-seizure drugs (also known as “anticonvulsants”), if pet has been on anticonvulsants
- Carefully cool the body, if the cat has an elevated body temperature (known as “hyperthermia”)

SURGERY

- Surgical opening of the skull (known as a “craniotomy”)—surgical removal of tumor or cancer (meningioma or other accessible mass)

MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- Seizure type and frequency determine therapeutic approach

Isolated Recurrent Generalized Seizures

- Medications to control seizures (known as “anti-epileptic drugs” or “anticonvulsants”)—phenobarbital, diazepam
- Initiate gradually to avoid overt sedation

Convulsive Cluster Seizures (more than one seizure in 24 hours) and Status Epilepticus (repeated or prolonged seizure activity)

- Treat cluster seizures and generalized status epilepticus early
- Medications to control seizures (anti-epileptic drugs or anticonvulsants)—phenobarbital, diazepam; choice and method of administration of medication based on status of seizure activity at time of presentation to the animal hospital

Persistent Seizures

- Propofol (an anesthetic drug) administered at doses below those needed to induce anesthesia

Other Medications

- Dexamethasone—a steroid to improve fluid build-up (known as “edema”) in the brain secondary to status epilepticus (repeated or prolonged seizure activity) and to treat the primary cause, if symptomatic epilepsy is suspected
- Gabapentin to help control seizures
- Levetiracetam to help control seizures

FOLLOW-UP CARE

PATIENT MONITORING

- Blood work (complete blood count [CBC], serum biochemistry profile) prior to initiating treatment, 4 to 6 weeks after starting phenobarbital, and repeat every 6 to 12 months
- Blood work (creatinine kinase [CK]) to evaluate muscle damage and subtle on-going seizure activity
- Measure phenobarbital serum level two weeks after initiation of treatment; dosage may be changed, based on blood test results; re-measure phenobarbital serum levels periodically until therapeutic range is reached
- Blood work (liver enzymes) 3 to 5 days after starting treatment with diazepam

POSSIBLE COMPLICATIONS

- Side effects of phenobarbital—low platelet count (known as “thrombocytopenia”), low white-blood cell count (known as “neutropenia”), itchiness (known as “pruritus”), or swollen feet; “platelets” and “thrombocytes” are names for the normal cell fragments that originate in the bone marrow and travel in the blood as it circulates through the body; platelets act to “plug” tears in the blood vessels and to stop bleeding
- Diazepam may cause sudden death of liver cells (known as “acute hepatic necrosis”)
- Cardiovascular and respiratory collapse from over dose

EXPECTED COURSE AND PROGNOSIS

- Depends on the underlying cause and response to treatment
- Cats with 'probably symptomatic epilepsy' have a good long-term prognosis
- Cats can recover despite episode of severe cluster seizures (more than one seizure in 24 hours) and generalized status epilepticus (repeated or prolonged seizure activity)

KEY POINTS

- Treat cluster seizures (more than one seizure in 24 hours) and generalized status epilepticus (repeated or prolonged seizure activity) early
- Anti-epileptic (anticonvulsant) treatment in symptomatic epilepsy may not help until the primary cause is addressed
- Keep a seizure calendar noting date, time, severity and length of seizures

