Southfields
veterinary specialists

NEUROLOGY AND NEUROSURGERY

FELINE EPILEPSY: UNDERSTANDING AND MANAGING SEIZURES

Epilepsy is a complex neurological disorder characterized by recurrent seizures.

Terminology and definition

First, let's clarify some terms. The International League Against Epilepsy (ILAE) provides a definition of an epileptic seizure as "a transient occurrence of signs and/or symptoms due to abnormal excessive or synchronous neuronal activity in the brain."

However, this definition doesn't always help clinicians distinguish epileptic seizures from other types. In practical terms, it's difficult to confirm abnormal brain activity, especially without sophisticated tools like electroencephalography (EEG). In cats, seizures might present very differently from dogs and it's sometimes difficult as a vet to ascertain that a cat is indeed having a seizure.

In general, we will classify seizures as

- Generalized: The cat will be stiff, on the side, shaking, salivating and urinating
- Partial seizures: Cats can be very prone to these. The signs might go from facial twitching , to mild salivation, to just looking glazed.

Causes of epilepsy in cats

Epilepsy in cats can have various causes. These include:

- Idiopathic Epilepsy (IE): This occurs when no underlying brain lesion is present. Although previously thought to be rare in cats, recent studies suggest that a considerable proportion of cats with recurrent seizures may have idiopathic epilepsy.
- Symptomatic Epilepsy (SE): This type of epilepsy implies the presence of an underlying brain lesion. Brain lesions can result from various factors, including infections, tumors, vascular issues, or toxic exposure.
- Probable Symptomatic Epilepsy: This category includes cases where brain lesions are suspected but cannot be identified.
- Reactive Epileptic Seizures: These seizures are triggered by external factors such as metabolic disorders or toxic substances.

A recent epidemiological investigation conducted in the United Kingdom revealed an overall prevalence of epilepsy, encompassing all subtypes

(idiopathic, structural, and unknown cause), among cats under primary veterinary care to be 0.04% based on evaluations by first-opinion veterinarians (O'Neill et al., 2020). Conversely, within referral settings, prevalence rates have been reported at higher levels ranging between 1.6% to 2.4% (Schriefl et al., 2008; Pakozdy et al., 2010). In these referral settings, the incidence of idiopathic and/or epilepsy of unknown cause (EUC) in cats ranged from 22% to 54%, with structural epilepsy accounting for 34% to 50% of cases (Schriefl et al., 2008; Pakozdy et al., 2010; Wahle et al., 2014).

Diagnosing epilepsy in cats

Diagnosing epilepsy in cats involves careful observation and a series of evaluations:

- Clinical signs: Cat owners should observe and record any unusual behaviours or symptoms exhibited by their pets. These can include restlessness, twitching, tremors, urination, or sudden bursts of activity.
- Veterinary examination: A thorough physical and neurological examination by a vet is essential to rule out other possible causes of seizures.
- Diagnostic tests: These may include blood tests, imaging studies like MRI or CT scans, and EEG if available. However, EEG is not widely used in veterinary practice due to its limitations. At Southfields Veterinary Specialists we have an advanced tool of video-EEG recording, which allows us to study these complicated cases.
- History-taking: Providing a detailed history of the cat's seizure episodes, including frequency, duration, and any potential triggers, can assist vets in making a diagnosis.

Treatment options

Treatment for epilepsy in cats aims to reduce the frequency and severity of seizures. Antiepileptic medications are the primary form of treatment. Phenobarbital is commonly used as a first-line drug, although other medications like levetiracetam or zonisamide may also be prescribed. Gabapentin and pregabalin can also be used.

Potassium bromide is the only medication used to treat dogs but this **cannot** be used in cats.

Prognosis

The prognosis for cats with epilepsy varies depending on the underlying cause, response to treatment, and other factors. Some cats may become seizure-free with medication, while others may experience a reduction in seizure frequency. Regular monitoring and adjustments to treatment may be necessary to manage the condition effectively. On rare occasions, some cats are extremely resistant to antiepileptic drugs and they might need to spend a few nights hospitalised while the seizures are controlled.

There is a specific syndrome called temporal lobe epilepsy that is found in both humans and cats, but not dogs. This syndrome might have different implications in how the cat responds to treatment.

Future perspectives

Advancements in diagnostic techniques, such as EEG, and a better understanding of the underlying mechanisms of epilepsy in cats are essential for improving diagnosis and treatment outcomes. Establishing clinical syndromes specific to feline epilepsy could also aid in diagnosis and management.

Why are cats so different to dogs when talking about epilepsy?

Certain specific types of epilepsy syndromes in cats, such as feline temporal lobe epilepsy (TLE), hippocampal sclerosis (HS), feline hippocampal necrosis (FHN), and autoimmune limbic encephalitis, present additional diagnostic complexities.

The exploration of feline temporal lobe epilepsy (TLE) has evolved significantly in recent years, shedding light on its clinical manifestations, underlying pathophysiology, diagnostic modalities, and therapeutic approaches.

The delineation of feline TLE as a distinct syndrome, characterized by epileptic discharges originating from specific temporal lobe structures, underscores its clinical relevance. Experimental studies dating back to the 1930s have provided a foundational understanding of TLE's semiology, particularly the orofacial automatisms indicative of its ictal progression.

Central to understanding feline TLE is its classification within the broader spectrum of veterinary epilepsy. While idiopathic, structural, and unknown causes delineate the primary etiological categories, TLE transcends these classifications, emerging as a syndrome linked to the anatomical substrate of the temporal lobe.

Comparisons with human temporal lobe epilepsy offer valuable parallels, elucidating shared pathogenic mechanisms and therapeutic strategies. The delineation between mesial and lateral temporal lobe epilepsy in humans underscores the importance of precise localization within the temporal lobe circuitry.

Diagnostic imaging, particularly MRI, serves as a cornerstone in the evaluation of feline TLE, revealing characteristic hippocampal changes indicative of necrosis or sclerosis. However, histopathological examination remains pivotal in confirming these findings and elucidating additional intra- and extra-hippocampal pathologies contributing to seizure genesis.

What is the clinical presentation of TLE and how is it different to other types of epilepsy?

A staging system of feline temporal lobe epileptic seizures has been developed and helps us to recognise these sometimes difficult seizures to observe.

- Stage 1: looking around, sniffing, attention
- Stage 2: immobility and staring (arrest)
- Stage 3: orofacial automatism (lip smacking, facial twitching, chewing, swallowing, blinking), hypersalivation, mydriasis
- Stage 4: masticatory movement, facial twitching
- Stage 5: head turning, head nodding
- Stage 6: generalised convulsive tonic-clonic seizure

Antiseizure management aims to optimize quality of life while minimizing adverse effects, with phenobarbital and levetiracetam emerging as primary therapeutic agents. However, the prognosis of feline TLE remains multifactorial, contingent upon factors such as underlying etiology, prompt initiation of treatment, and severity of hippocampal pathology.