
The Essentials of
EPILEPSY MANAGEMENT IN DOGS
vet candy
With
Dr. Gaemia Tracy

QUICK & DIRTY: DECODING CANINE EPILEPSY

PHASES

1) **PRE-ICTAL**: CAN INCLUDE UNUSUAL BEHAVIOUR ex. hiding, seeking attention

2) **ICTAL**: THE SEIZURE ITSELF

3) **POST-ICTAL**: CAN INVOLVE DISORIENTATION, TIREDNESS, TEMPORARY VISION LOSS & MAY LAST SEVERAL DAYS

FOCAL SEIZURES

* CERTAIN MUSCLE GROUPS
* DOG IS USUALLY CONSCIOUS

ABSENCE SEIZURES

* BRIEF ZONING OUT
* DOG LOSES CONSCIOUSNESS

(AKA GRAND MAL) GENERALIZED SEIZURES

* FULL-BODY CONVULSIONS
* DOG LOSES CONSCIOUSNESS
* 30 sec → 3 minutes

DIAGNOSTIC TESTS
Bloodwork, urinalysis, MRI, spinal fluid analysis

DOG'S HISTORY
SEIZURE DESCRIPTION

DIAGNOSIS

* **CONSISTENT MEDICATION** IS
* **COMBINATION THERAPY** MAY BE NECESSARY

TREATMENT

ANTI-SEIZURE MEDICATION

[POTASSIUM BROMIDE (KBr), PHENOBARBITAL, LEVETIRACETAM, ZONISAMIDE, TOPIRAMATE]

SPECIFIC MEDICATION FOR SOME INFLAMMATORY CONDITIONS

SURGERY OR OTHER...

OUR GOAL: TO SIGNIFICANTLY REDUCE SEIZURES!

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Essentials of Canine Epilepsy by Dr. Gaemia Tracy, et al.

KBroVet®-CA1 (potassium bromide chewable tablets) For complete prescribing information, see full package insert. **Caution:** Federal law restricts this drug to use by or on the order of a licensed veterinarian. It is a violation of Federal Law to use this product other than as directed in the labeling. **Indication:** for the control of seizures associated with idiopathic epilepsy in dogs. **Warnings:** Not for human use. Keep out of reach of children. Contact a physician in case of accidental ingestion by humans. KBroVet®-CA1 should not be used in animals with a history of hypersensitivity to bromide or any of the components of the tablets. Not for use in cats. Keep tablets in a secured location out of reach of dogs, cats, and other animals to prevent accidental ingestion or overdose. **Precautions:** The safe use of KBroVet-CA1 Chewable Tablets has not been evaluated in dogs that are intended for breeding, that are pregnant or lactating, or less than 6 months of age. Reproductive effects of potassium bromide (KBr) have been reported in other species. In dogs, ataxia, diarrhea, hematochezia, excessive salivation, shivering, skin lesions, stupor progressing to coma, and death have been reported with high doses.[1,2] Dogs receiving KBroVet-CA1 should be carefully monitored when changing diets, administering chloride-containing IV fluids, and administering concurrent medications. Careful monitoring is important in dogs that have a condition that may cause difficulty maintaining electrolyte balance. Animals with decreased renal function may be predisposed to bromide toxicosis. Some dogs may experience epileptic episodes that are unresponsive or refractory to KBr monotherapy and KBr alone may not be adequate treatment for every dog with idiopathic epilepsy. **Adverse Reactions:** In a retrospective field of study of 51 dogs diagnosed with idiopathic epilepsy and treated with KBr, the most common clinical abnormalities documented in the 60 day period after start of KBr therapy were increased appetite, weight gain, vomiting/regurgitation and sedation. Additional field reports of clinical abnormalities in dogs dosed with KBr for idiopathic epilepsy showed polyphagia, polyuria, polydipsia, weight gain, lethargy and decreased physical activity. Ataxia was the most common body-system (i.e. CNS) specific clinical finding. Adverse events associated with concurrent use of KBr with other antiepileptic drugs such as phenobarbital have been reported, including sedation, irritability, restlessness, depression, behavioral changes, ataxia, hind limb paresis, mydriasis, stupor, and coma. These neurologic signs were reported to be reversible.[1,3] **Reasonable Expectation of Effectiveness:** This drug is conditionally approved pending a full demonstration of effectiveness. In a dose determination retrospective study involving a total of 284 canine case records, the mean total oral dose was determined to be 46.6 (±21.9) mg/kg/day with a range of 24.5-68.3 mg/kg/day, describing the range to achieve serum bromide concentrations within 10% of the published therapeutic range for dogs with idiopathic epilepsy. In a pilot retrospective study spanning a 5.7 year period, involving the review of case records of 51 client-owned dogs contributed by 18 veterinarians, and comparing the 30 day period before initial treatment with KBr and the 30 day period of steady state KBr dosing, 27 cases were determined as valid for evaluation of effectiveness. The mean maintenance dose in those 27 cases was 37 mg/kg/day, with a mean duration of 286 days. Approximately 67% of those cases were dosed once daily and 33% were dosed twice daily. Based on seizure count results, 70% of the 27 cases were defined as "success" and 30% were defined as "failures." Based on seizure event day results, 67% were defined as "success" and 33% were defined as "failures." Seizure severity score decreased or did not change in 25 of the 27 cases evaluated for effectiveness. Overall, of the 27 dogs included in the effectiveness analysis, 67% were considered treatment successes and 33% were considered treatment failures. **To obtain full product information please call 800-874-9764 or visit KBroVet.com.**

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4. Podell, M., & Fenner, W. R. (1993). Bromide therapy in refractory canine idiopathic epilepsy. Journal of Veterinary Internal Medicine, 7(5), 318-327.

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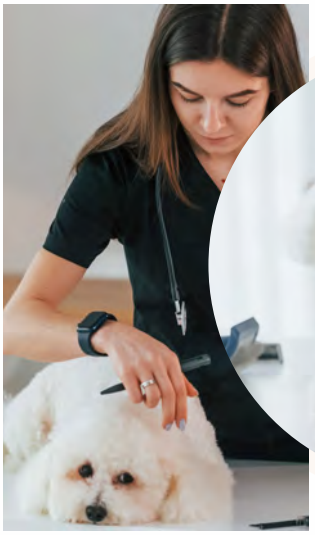

ESSENTIALS OF EPILEPSY MANAGEMENT IN DOGS *By Dr. Gaenia Tracy*

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Comprehensive Insights into Canine Epilepsy Management: A Veterinary Perspective

Dr. Gaemia Tracy

Canine epilepsy, characterized by seizures or convulsions, presents a challenging neurological puzzle for both pet owners and veterinary professionals. This multifaceted disorder involves paroxysmal disturbances in the cerebral (forebrain) region, resulting in abnormal electrical activity and overt signs known as seizures. In this exploration of canine epilepsy, we will delve into the intricacies of this condition, encompassing causes, seizure types, diagnostics, and treatment.

Understanding Canine Seizures

Canine seizures are intricate events characterized by sudden, abnormal electrical activity in the brain, resulting in a loss of consciousness or control over a specific muscle group. Identifying the root causes of seizures is paramount for effective management, with triggers ranging from metabolic disorders, brain tumors, toxin ingestion, trauma, birth defects, to idiopathic epilepsy.

Exploring Types of Canine Seizures

Seizures in dogs manifest in different forms, each presenting distinct characteristics. Focal seizures affect specific muscle groups, with dogs typically remaining conscious. Absent seizures may involve staring off or zoning out, often accompanied by falling over or loss of consciousness. Generalized seizures, or "Grand Mal," encompass full-body convulsions with a loss of consciousness, lasting between 30 seconds to 3 minutes.

The Three Phases of a Canine Seizure

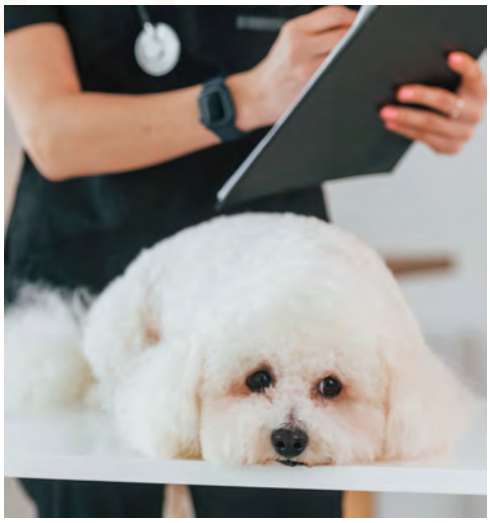
Understanding the three phases of a canine seizure is crucial for both pet owners and veterinarians. The pre-ictal phase may involve hiding or attention-seeking behavior, along with signs of worry or confusion. The ictal phase encompasses the seizure event, while the post-ictal phase may include confusion, fatigue, aggression, loss of vision, and pacing, potentially lasting up to one week.

Diagnostic Procedures for Canine Seizures

Diagnosing the cause of seizures in dogs necessitates a comprehensive evaluation by veterinarians. This involves discussing the pet's general history, seizure frequency, and their appearance. Diagnostic tools may include general chemistry, complete blood count (CBC), urinalysis, and advanced procedures such as brain MRI and spinal tap for cerebrospinal fluid analysis.

Treatment Options for Canine Seizures

The treatment approach for canine seizures varies based on the underlying cause. Idiopathic epilepsy often involves the use of anti-seizure medications. Conditions like meningitis may require anti-inflammatory and immunosuppressive medications, while brain tumors may necessitate surgical intervention, radiation therapy, or chemotherapy. Immediate toxin removal is crucial for toxin ingestion cases. Supportive care and blood thinners may be prescribed for strokes, and addressing specific diseases is essential for metabolic conditions.



Understanding Canine Epilepsy Medications: A Multifaceted Approach

Managing canine epilepsy often involves a combination of medications tailored to the individual needs of each patient. The following medications are commonly used, each with its unique mechanism of action:

PRN PHARMACAL

There's help to steady the storm

Formulated specifically for dogs, conditionally approved KBroVet®-CA1 is a flavored, once-a-day option to control seizures associated with idiopathic epilepsy. Renally excreted, it's an ideal choice for dogs with compromised liver function.

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Phenobarbital:

Mechanism of Action: As a barbiturate, phenobarbital enhances the activity of the neurotransmitter gamma-aminobutyric acid (GABA), resulting in a calming effect on the brain.

Monitoring:
Therapeutic blood level testing is available to ensure the medication is within the optimal range for seizure control.

Phenobarbital for Seizure Control
In addition to potassium bromide, phenobarbital stands out as a notable medication for controlling seizures in dogs. As a barbiturate, phenobarbital works by enhancing the activity of a neurotransmitter called gamma-aminobutyric acid (GABA), resulting in a calming effect on the brain. It is often prescribed for long-term use and requires careful monitoring to ensure therapeutic blood levels are maintained.

Potassium Bromide (Kbr):

Potassium bromide emerges as a well-established medication in the management of seizures in canine patients, especially those with idiopathic epilepsy. This antiepileptic drug plays a pivotal role in stabilizing nerve cell membranes and reducing the excitability of neurons, minimizing the occurrence of seizures. superscript ®-CA1, an FDA conditionally approved flavored chewable tablet containing potassium bromide, is a valuable addition to the treatment arsenal. KbroVet(R)-CA1 is administered once a day and has a 21 day half-life.

Mechanism of Action:
KBr, a halide salt, passes through neuronal chloride ion channels, hyperpolarizing neuronal membranes. This raises the seizure threshold and stabilizes neurons against excitatory input from epileptic foci.

Monitoring:
Like phenobarbital, therapeutic blood level testing is employed to maintain an effective concentration in the dog's system.

Administration and Monitoring of Potassium Bromide
Typically administered orally, the efficacy of potassium bromide is closely monitored through therapeutic blood level testing. This ensures that the medication is at an optimal concentration in the dog's system to effectively control seizures. The dosage of potassium bromide is often weight-dependent, emphasizing the importance of precise dosing.

Levetiracetam:

Mechanism of Action:
Levetiracetam modulates neurotransmitter release by binding to synaptic vesicle protein SV2A, thus reducing neuronal hyperexcitability.

Monitoring:
While therapeutic blood level testing is less common for levetiracetam, regular veterinary check-ups are essential to assess overall health.

Zonisamide:
Mechanism of Action: Zonisamide primarily works by blocking sodium and calcium channels, stabilizing neuronal membranes and reducing excitability.

Monitoring: Close veterinary monitoring is crucial to evaluate the medication's effectiveness and address any potential side effects.

Topiramate:

Mechanism of Action:
Topiramate modulates sodium channels, enhances GABA activity, and inhibits excitatory neurotransmitters, collectively contributing to its antiepileptic effects.

Monitoring:
Veterinary supervision is necessary to adjust the medication based on the individual response of the patient.

Long-Term Considerations and Combination Therapy

Once anti-seizure medication is initiated, it is typically a lifelong commitment. Consistency in administration is paramount to achieving optimal seizure control. In certain cases, a combination of medications, known as combination therapy, may be recommended. This approach aims to address seizures comprehensively by leveraging the strengths of different medications.

Optimal Seizure Control and Seeking Urgent Veterinary Care

Achieving optimal seizure control is a primary goal, defined as experiencing one seizure every 2 to 3 months or a 50% reduction in overall seizure frequency. Vigilant pet owners should seek veterinary attention in scenarios such as cluster seizures or status epilepticus, where injectable anti-seizure medication may be required.

Maintaining a Seizure Log for Canine Epilepsy

Pet owners can significantly contribute to the management of canine epilepsy by maintaining a seizure log. This log helps identify patterns, triggers, and potential factors influencing seizure occurrence. Record details such as the date, time, duration, nature of the event, and associated circumstances.

Monitoring and Therapeutic Blood Level Testing

Therapeutic blood level testing plays a pivotal role in the ongoing management of canine epilepsy. Regular testing ensures that the concentration of the medication in the dog's system is within the therapeutic range, maximizing efficacy while minimizing potential side effects. For medications like phenobarbital and potassium bromide, these tests provide valuable insights for adjusting dosage as needed.

Collaborative Care for Canine Epilepsy Patients

Effective management of canine epilepsy requires a collaborative effort between pet owners and veterinary professionals. Open communication is essential for monitoring the pet's response to medication, addressing concerns, and making informed decisions about potential adjustments to the treatment plan.

As we unlock the secrets of canine epilepsy treatment, a personalized and nuanced approach emerges. Medications like phenobarbital, potassium bromide, levetiracetam, zonisamide, and topiramate offer hope for seizure control, with ongoing monitoring and therapeutic blood level testing guiding the way. The commitment to lifelong medication and the possibility of combination therapy underscore the importance of a collaborative journey towards enhancing the quality of life for our furry companions affected by epilepsy.

Effectively managing seizures in dogs is an art, as each pet responds uniquely to various medications. Open communication and collaboration between veterinarians and pet owners are key. Sharing experiences and insights contribute to a collective understanding of this complex neurological condition, ultimately enhancing the quality of life for dogs affected by epilepsy. If your pet has experienced seizures, consult with your veterinarian to tailor a comprehensive and individualized treatment plan suited to your furry friend's specific needs.

Deciphering the Multifactorial Etiology of Canine Epilepsy: A Comprehensive Review

Canine epilepsy, a prevalent neurological disorder, poses significant challenges in both diagnosis and treatment. This comprehensive review delves into the multifaceted etiology of epilepsy in dogs, exploring genetic predispositions, environmental factors, and emerging research in this field.

Epilepsy in dogs remains a compelling subject of study, given its impact on the quality of life for affected canines and their owners. Understanding the diverse causes of epilepsy is crucial for effective diagnosis and targeted therapeutic interventions.

Genetic Predispositions

Genetic factors play a substantial role in canine epilepsy, with several breeds demonstrating a predisposition to the disorder. The identification of specific genetic markers associated with epilepsy, such as mutations in ion channels and neurotransmitter receptors, has provided valuable insights into the hereditary nature of the condition.[1]

Environmental Triggers

Environmental factors contribute significantly to the manifestation of epilepsy in susceptible dogs. These triggers may include exposure to toxins, infectious agents, or traumatic events. Investigating the interplay between genetic predispositions and environmental influences is essential for a comprehensive understanding of epilepsy etiology.[2]

Inflammatory and Immune Mechanisms

Emerging research suggests a link between epilepsy and inflammatory or immune-mediated processes. Understanding the role of neuroinflammation and autoimmune responses in the development of seizures provides new avenues for therapeutic exploration.[3]

Metabolic Disorders

Certain metabolic disorders, such as hepatic encephalopathy or hypoglycemia, can lead to seizures in dogs.[4] Exploring the intricate connections between metabolic irregularities and epilepsy broadens our comprehension of the disorder's underlying mechanisms.

Neuroanatomical Abnormalities

Structural abnormalities within the canine brain, including malformations or neoplasms, may serve as focal points for epileptic activity. Advanced imaging techniques enable researchers to correlate neuroanatomical irregularities with seizure occurrence.

As our understanding of canine epilepsy evolves, ongoing research aims to unravel additional complexities in its etiology. Targeting specific causative factors will undoubtedly enhance diagnostic accuracy and guide the development of more effective therapeutic strategies for dogs with epilepsy.

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KBroVet®-CA1
(potassium bromide chewable tablets)

Formulated specifically for dogs, conditionally-approved KBroVet-CA1 is an option to control seizures associated with idiopathic epilepsy. It's an ideal choice for dogs with compromised liver function that cannot tolerate anticonvulsants that affect the liver.

KBroVet-CA1 has the longest half-life of all seizure medication options. So if an owner misses a dose, fluctuation in drug concentration is unlikely to occur, minimizing the occurrence of a seizure.

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Phenobarbital in the Management of Canine Seizures

Pharmacology of Phenobarbital:

Phenobarbital, a long-acting barbiturate, exerts its anticonvulsant effects by augmenting inhibitory neurotransmission via gamma-aminobutyric acid (GABA). Its interaction with the GABA-A receptor extends the opening time of the associated chloride ion channel, leading to increased inhibitory postsynaptic potentials and reduced neuronal excitability, ultimately mitigating seizure activity.

Mechanisms of Action:

Beyond GABAergic modulation, phenobarbital may also act through glutamate antagonism, further diminishing excitatory neurotransmission and dampening neuronal hyperexcitability.

Dosing Considerations:

Orally administered, phenobarbital boasts a lengthy half-life in dogs, ranging from 40 to 120 hours. Initial dosing, typically at 2 to 3 mg/kg twice daily, may be adjusted based on therapeutic response and serum drug concentrations.

Monitoring Parameters:

Routine monitoring of serum phenobarbital concentrations is paramount, maintaining levels within the therapeutic range of 15 to 40 µg/mL. Liver function tests and complete blood counts (CBC) should be regularly assessed due to potential hepatotoxicity and hematological side effects.

Potential Side Effects:

Long-term phenobarbital use may pose hepatotoxic risks, necessitating vigilant liver function monitoring. Common side effects include polyphagia, weight gain, and sedation, the latter especially during initial treatment phases. Adjustments in dosage may be required to strike a balance between seizure control and sedation avoidance.

Phenobarbital remains a pivotal option for managing canine seizures, offering effective control of epileptic episodes. However, its use mandates careful consideration of individual patient factors, vigilant monitoring of serum drug concentrations, and a watchful eye for potential side effects. Veterinary professionals must stay abreast of the latest research and guidelines to optimize outcomes for their patients.

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The History of Potassium Bromide - The World's Oldest Anticonvulsant

Rebecca Windsor DVM, DACVIM (Neurology)

Potassium bromide (KBr) has a fascinating and somewhat disturbing history. Bromide is the oldest anticonvulsant and was used in humans in the early 1800s to treat a variety of conditions (in many cases unsuccessfully) including syphilis, priapism, splenomegaly, tetanus, whooping cough, and gout. It became recognized as a potential effective anti-epileptic drug (AED) after its use by obstetrician Sir Charles Locock in 1857 for the treatment of "hysterical epilepsy" in women.[1,2] Hysterical epilepsy, or epilepsy deriving from the uterus, is suspected to refer in part to catamenial epilepsy, which affects approximately 1/3 of epileptic women and has been defined as an increase in seizure frequency beginning immediately before or during menses.[3] Several references also suggest hysterical epilepsy referred to epilepsy that was believed to be triggered by sexual excitement in women.[1,2] This confusion may be due in part to the historical connection between epilepsy and syphilis. Syphilis affected over 20% of people aged 15-34 in late 18th century London, and epilepsy was a common complication in many patients. Syphilis was known to be a sexually transmitted disease and women with syphilis were considered promiscuous, sexually immoral, and treated as social outcasts. Many women around the world were institutionalized due to concern they would infect soldiers with syphilis and destroy militaries. Sir Charles Locock took bromide himself and discovered it caused impotence.[1,2] This served as further evidence to Locock that bromide's ability to reduce sexual excitement was the likely cause for seizure reduction.[1,2] Bromide became widely used as an AED at that time and was later used most commonly as a sedative to treat insomnia and dampen sexual excitement in women and men.

In 1859, Sir Samuel Wilks, a physician and later President of the Royal College of Physicians of London, began using bromide to treat all forms of epilepsy and was the first to publish on its efficacy in 1861.[1,2] At that time, iodide was used most commonly to treat syphilis. Sir Wilks used bromide as an alternative to iodide as it was more effective in treating goiter and glandular swellings and coincidentally found it to be more effective in treating seizures as well.[2]

Phenobarbital replaced bromide as the AED of choice in humans in 1912, and bromide has been essentially obsolete in the management of human epilepsy since the 1920s due to prominent negative side effects including sedation, weakness, psychotic behaviors, and coma. Bromide is now only recommended as a tertiary AED for select refractory seizure disorders in children when other treatments have failed.[4,5]

Use of Bromide in Animals

Bromide was described for use in animals in the late 1800s[9] but gained popularity as an AED in the 1980s.[6] KBr is reportedly the second most commonly prescribed AED behind phenobarbital; most veterinarians use it as an add-on medication when seizures are not well controlled with phenobarbital alone.[10] About half of epileptics can be controlled with an appropriate dose of the first AED regardless of mechanism of action assuming it decreases neuronal excitation and/or increases neuronal inhibition, and studies in humans have shown no specific drug superiority.[6] Some drugs are undoubtedly better tolerated than others and drug side effect profile greatly influences AED choice in humans, thereby limiting the use of KBr. The body of evidence adequately evaluating AEDs in veterinary medicine is very limited given how few studies are designed as prospective, randomized, blinded, placebo-controlled, cross-over studies with large enough sample size and adequate follow up time to assess seizure control. Many veterinary AED studies also carry inherent selection, performance, and detection bias which make results challenging to interpret.[6-8]

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Potassium Bromide as an Adjunctive to Phenobarbital

Phenobarbital was essentially the sole AED used in animals for many years. Potassium bromide was introduced primarily as an adjunctive medication in dogs where phenobarbital was ineffective (even at high doses) or in dogs with severe hepatoxicity or bone marrow suppression associated with phenobarbital.[11] When added to phenobarbital, there is a reported decrease in seizure frequency and intensity, however there is a high degree of bias in many KBr drug studies.[6,12-14] There are a few blinded, randomized clinical trials evaluating the efficacy of KBr and it is currently considered a grade B anticonvulsant, meaning it has been given a moderate recommendation and is most likely an effective treatment.[6,8] In some dogs, addition of KBr allows for dose reduction or complete tapering and discontinuation of phenobarbital.[12-14] Steady state bromide levels should be achieved before attempting to wean off phenobarbital.[12]

Potassium Bromide as a monotherapy

Potassium bromide has several potential benefits as a monotherapy including low cost and long half-life that allows once daily dosing, a huge benefit for families where scheduling makes twice daily drug administration challenging or when owner administration of AEDs is inconsistent/unreliable (long half-life makes a missed dose less likely to cause seizures than missing dose of other AEDs). Potassium bromide is also favored in situations of liver or bone marrow disease. Potassium bromide does not have any identified drug interactions nor does it interfere with thyroid hormone monitoring, both common problems with phenobarbital.[6] In the few studies reporting the efficacy of KBr as a monotherapy, a reduction in seizure frequency is seen in most dogs.[6,15] Side effects are typically less severe when KBr is used alone.[9]

Side effects of Potassium Bromide

Although seizure reduction is often the primary goal in epilepsy management, it is very important to recognize and acknowledge owner concerns about negative AED effects that can have a profound impact on quality of life. Whereas many veterinarians may prioritize seizure control when choosing and adjusting AEDs, owners often value AED side effects and overall effect on pet and family quality of life as greatly.[16] The most common side effects of KBr as a monotherapy include ataxia, sedation, hyperactivity, polyuria (PU), polydipsia (PD), polyphagia (PP), diarrhea, tetra or paraparesis, vomiting, anorexia, aggression, dermatologic issues, and elevated ALP/ALT.[7,17] Over 1/2 of dogs have PD and 1/3 show excessive sedation and ataxia.[13] The level of ataxia, sedation, PU/PD/PP, tetra or paraparesis, and liver enzyme elevations is compounded with combined phenobarbital use.[7,17] Other more severe adverse events that have been reported include pancreatitis (fatal in some dogs)[18], panniculitis[19], neuromyopathy with generalized lower motor neuron signs[20], generalized appendicular repetitive myoclonus, and hyperchloremia with negative anion gap after loading dose.[7] Side effects associated with KBr are generally seen with adjunctive treatment or high serum bromide levels.[9] Bromide serum levels were higher than the recommended margins in 58% of dogs with less severe adverse effects, however they were within normal ranges for 67% of dogs more severe adverse effects, therefore it may be individual dog sensitivity that dictates drug reaction as much as blood level.[7]

Gastrointestinal upset can be acute or chronic and lead to discontinuation of bromide in some dogs. Vomiting is thought to occur due to direct irritation of the gastrointestinal lining and may be more common during the loading period.[21] Potassium bromide in capsule form is a stronger gastric irritant due to direct contact of a concentrated amount of drug with the gastric mucosa[6], therefore liquid formulation is recommended to limit gastric irritation. Administering KBr with food can also reduce gastrointestinal irritation, and it is not recommended to give KBr in a dog that is anorexic or vomiting.[9]

Acute and chronic vomiting can also be seen in dogs on KBr due to predisposition to develop pancreatitis in some dogs. High fasting triglyceride levels have been reported in 1/3 of dogs receiving phenobarbital and KBr[22] and could be a risk factor for pancreatitis, therefore fasting triglyceride levels should be periodically monitored in dogs on KBr, especially if concurrently taking phenobarbital. KBr and phenobarbital have also been associated with increased pancreas-specific lipase which is associated with an increase in triglycerides, ALP, and ALT but not necessarily an increased risk for acute pancreatitis.[23,24]

Although KBr is a somewhat effective AED in cats, it results in a severe and potentially fatal pneumonitis in about 50% of cats and is therefore not a recommended AED in cats.[25] Bromide has been used as a sedative and AED in horses, but neurological side effects often preclude its use due to concern for horse and rider safety.[26]

Bromide Neurotoxicosis aka, Bromism

The term "bromism" refers to neurotoxicosis associated with high levels of bromide and is typically reversible with dose lowering.[17] The potential for bromism greatly limited its use after the early 1900s in humans due to the potential for addiction[2] and intoxication manifesting as severe neuropsychiatric (lethargy, sleepiness, confusion, hallucinations, muscle pain, ataxia, stupor, and coma), dermatological (acneiform and erythematous rashes, nodular and pustular skin lesions) and gastrointestinal (nausea, vomiting, anorexia) complications.[9,17] Chronic KBr administration at 50 mg/kg/day has also been shown to significantly reduce cognitive function in rats.[27]

Although a high bromide blood level is more likely to be associated with bromism, individual tolerance between dogs indicates bromide level is poorly predictive of adverse drug effects.[11,17] Breed predisposition, concurrent neurological disease, combination AED therapy, and reduced salt intake[28] are all risk factors to develop bromism.[17] Bromism has also been associated with reduction in renal function[17], however signs of renal dysfunction including PU/PD may be difficult to recognize in a dog on KBr. Rarely bromism can occur due to excess bromide after ingesting water with high bromide content (i.e. chemically treated spa water) or other medications containing bromide. Treatment for bromism typically involves saline diuresis and in some cases the use of additional diuretics including furosemide.[17]

KEY POINTS:

Bromide works by:

- Competing with chloride at neuronal membranes causing hyperpolarization, raising the seizure threshold and making seizures less likely to occur
- Potentiating GABA-activated currents, thereby inducing hyperpolarization

Bromide level is affected by:

- Total and any change in dietary salt content - increased salt makes bromide level go down
- Excess salt consumption from non-dietary sources
- Renal disease - decreased excretion makes bromide level go up

Bromide should be ideally administered as:

- Once a day
- With food

Bromide dosing and monitoring:

- 30-40 mg/kg - sole agent; 20-30 mg/kg - adjunctive agent
- Load at 450-600 mg/kg divided over 1-5 days to achieve steady state levels more quickly
- Check blood level at 2-3 months then annually
- Monitor renal function (biochemistry panel, urinalysis) annually
- Monitor triglycerides annually

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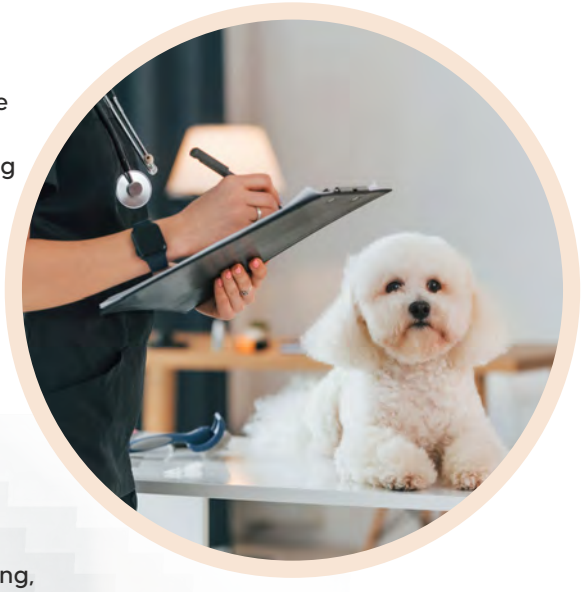

Pharmacology of Levetiracetam:

Levetiracetam's unique mechanism of action involves binding to synaptic vesicle protein 2A (SV2A), a protein crucial for neurotransmitter release. By modulating SV2A, levetiracetam contributes to the regulation of neuronal excitability, making it an effective antiepileptic agent.

Mechanisms of Action:

Levetiracetam's primary target, SV2A, is found on synaptic vesicles in neurons. Through its binding to SV2A, levetiracetam modulates neurotransmitter release, dampening excessive neuronal activity and reducing the likelihood of seizures.

Dosing Considerations:

Levetiracetam is administered orally, and its relatively short half-life in dogs necessitates multiple daily doses. While individual patient factors influence dosing, a common starting dose is 20 mg/kg administered every 8 hours. Adjustments may be made based on therapeutic response.

Monitoring Parameters:

Routine monitoring is essential to ensure therapeutic efficacy and detect potential adverse effects. While levetiracetam does not require routine serum concentration monitoring, regular clinical assessments, including neurological evaluations, are crucial.

Potential Side Effects:

Levetiracetam is generally well-tolerated in dogs, with few reported adverse effects. Mild sedation and gastrointestinal upset may occur initially but often diminish with continued use. Unlike some other antiepileptic drugs, levetiracetam has a favorable side effect profile, making it a valuable option for long-term seizure management.

Levetiracetam has emerged as a valuable addition to the therapeutic arsenal for managing seizures in dogs. Its unique mechanism of action, favorable side effect profile, and ease of administration make it an attractive choice for both primary and adjunctive treatment. Veterinary professionals should stay informed about current research and guidelines to optimize the use of levetiracetam in their patients.

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Zonisamide in Canine Seizure Management:

Pharmacology of Zonisamide:

Zonisamide's multifaceted pharmacology involves blocking sodium and calcium channels, thereby stabilizing neuronal membranes and inhibiting excitatory neurotransmitter release. Additionally, zonisamide modulates GABAergic neurotransmission, contributing to its anticonvulsant effects.

Mechanisms of Action:

Zonisamide's inhibition of sodium and calcium channels reduces neuronal excitability, impeding the initiation and propagation of seizures. Furthermore, its positive modulation of GABAergic transmission enhances inhibitory effects, providing comprehensive seizure control.

Dosing Considerations:

Administered orally, zonisamide offers the advantage of once-daily dosing in dogs. The recommended starting dose is generally 5 mg/kg once daily, with gradual increases based on therapeutic response. Regular reassessment of dosages ensures optimal seizure management.

Monitoring Parameters:

Routine monitoring is crucial to assess therapeutic efficacy and detect potential adverse effects. While zonisamide does not typically require routine serum concentration monitoring, periodic clinical evaluations, including neurological assessments, are essential.

Potential Side Effects:

Zonisamide is generally well-tolerated in dogs, with few reported adverse effects. Gastrointestinal upset and sedation may occur initially, but these effects often diminish with continued use. Careful monitoring is advised, particularly for potential idiosyncratic reactions, such as hepatotoxicity or blood dyscrasias.

Zonisamide stands as a valuable therapeutic option for managing seizures in dogs, offering a diverse array of mechanisms to address various aspects of epileptogenesis. Its once-daily dosing and favorable side effect profile contribute to its appeal as a primary or adjunctive treatment. Veterinary professionals should remain abreast of current research and guidelines to optimize the use of zonisamide in their epileptic patients.

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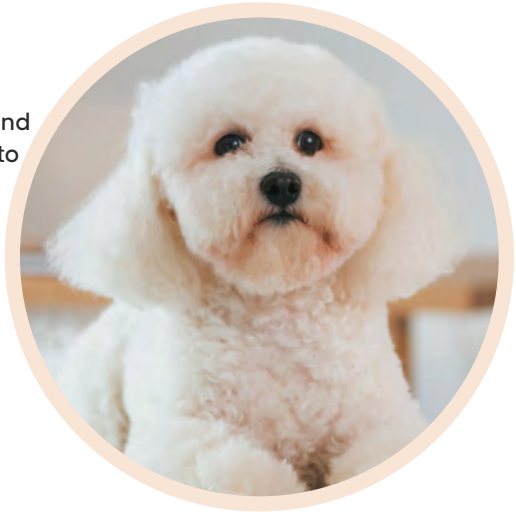
Topiramate in Canine Seizure Management:

Pharmacology of Topiramate:



Topiramate's pharmacology encompasses multiple mechanisms, including the enhancement of GABAergic neurotransmission, blockade of sodium channels, and antagonism of glutamate receptors. This comprehensive approach contributes to its efficacy in controlling seizures.

Mechanisms of Action:

Topiramate's unique profile involves the modulation of neurotransmitters crucial in the epileptic process. By enhancing inhibitory GABAergic activity, blocking excitatory sodium channels, and antagonizing glutamate receptors, topiramate addresses various facets of neuronal excitability, providing robust anticonvulsant effects.

Dosing Considerations:

Administered orally, topiramate offers flexibility in dosing frequencies, with once or twice-daily regimens. The initial dose is typically 2 to 5 mg/kg twice daily, with subsequent adjustments based on clinical response. Individual patient factors, including concurrent medications, influence dosing considerations.

Monitoring Parameters:

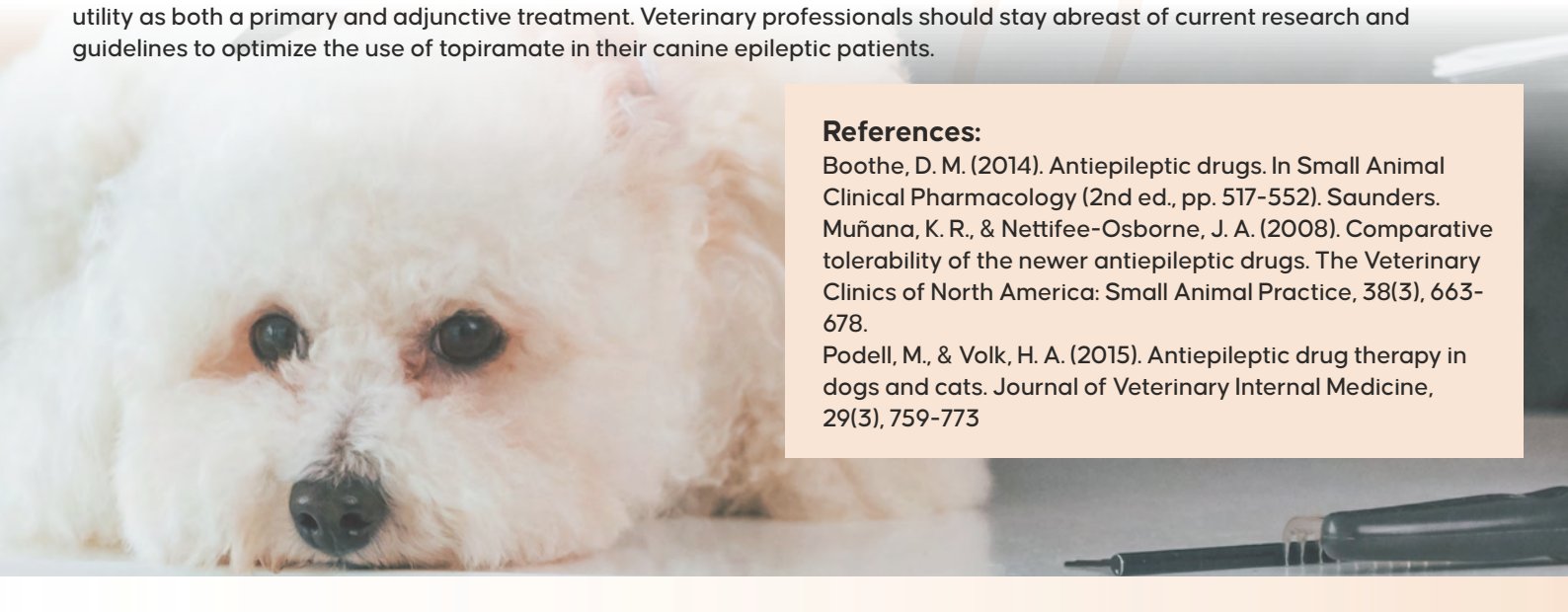
Regular monitoring is imperative to gauge therapeutic efficacy and identify potential adverse effects. While routine serum concentration monitoring is not standard for topiramate, periodic clinical evaluations, including neurological assessments, aid in optimizing treatment.

Potential Side Effects:

Topiramate is generally well-tolerated in dogs, with reported side effects typically being mild and transient. Gastrointestinal upset, sedation, and weight loss may occur initially but often diminish with continued use. Veterinary professionals should remain vigilant for potential idiosyncratic reactions, including renal calculi formation.

Conclusion:

Topiramate emerges as a versatile antiepileptic option for managing seizures in dogs, offering a multifaceted approach to seizure control. Its varied mechanisms of action, flexible dosing, and generally favorable side effect profile contribute to its utility as both a primary and adjunctive treatment. Veterinary professionals should stay abreast of current research and guidelines to optimize the use of topiramate in their canine epileptic patients.



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Ultimate Guide to Educating and Supporting Owners of Newly Diagnosed Epileptic Pets!

by Dr. Ryan Gibson

The hard truth is that veterinarians are not the most essential members of our patients'healthcare team - that distinction falls to our clients, the pet owners. While veterinarians are instrumental in identifying the cause of seizures and providing recommendations for therapy, at the end of the day, we are not the ones responsible for giving medications three times a day or living through the day-in and day-out fear of our pet having a seizure. Veterinarians must recognize the role pet owners play in caring for their pets. The emotional toll and burden of care for chronic illnesses often put a strain on the human-animal bond. This strain may lead to the euthanasia of the pet when this relationship is negatively affected. Empowering pet owners with knowledge is as important as diagnosing and prescribing medications when managing a condition such as seizures.

One study suggests that the most common cause for euthanasia in epileptic patients is an unacceptable level of control (Berendt, 2007). At the same time, another study from the UK reports that only 21% of pet owners considered themselves 100% compliant, with the median days of missed treatment reaching six days (Booth, 2020). Within this disconnect, we, as veterinarians, can advocate for both pets and their owners: education about seizures, expectations of therapy, anticipated side effects, and definition of control can be vital to saving a patient's life. Ensuring that we understand and help establish appropriate expectations for our clients and their pets can make all the difference in how that owner perceives therapeutic success. Discussion of seizures themselves is innately complicated, which is then exacerbated by the need to discuss additional related topics, including seizure logs, emergency situations, expectations, side effects, etc. In my experience, educated clients who feel they have a grasp of the overall condition and plan, have actionable plans in place for emergency situations, and have defined expectations for the outcome are better able to manage their pet's care and their own emotions during a seizure episode. However, for busy veterinarians, this can be difficult to accomplish within 15–30-minute exam slots. There are multiple options veterinarians can employ to ensure their time is utilized to peak efficiency while also ensuring they can `cover the most important aspects of client education.

Client handouts have long been utilized but have limitations. Clients must actually read this information, and for those who do, the opportunity to ask follow-up questions is often lacking. A more valuable option for clients includes training, engaging, and utilizing our technicians to have these more in-depth conversations, allowing them to be part of the relationship and management team for pets with chronic illnesses. This methodology works for the benefit of all. It builds trust between the client and technician, preventing those awkward "can I just talk to the doctor" calls, allows a team approach to handling various questions, and raises our technicians up to the level of utilization they deserve! However, a balance must be found if utilizing this method; as we all know, great veterinary technicians are also very busy and keep our hospitals running. A third method to improving client education is using a third-party education program or hosting client education days at your clinic, bringing clients with similar diagnoses together.

Petparenteducators.com was developed following the human diabetes education model and seeks to help provide foundational education for newly diagnosed patients with seizures and other chronic conditions via modules and live-based educational experiences. Utilizing these programs allows your team to focus conversations on the most critical questions related to specific care while giving your clients the knowledge base they need to best care for their pets!

Outside of ensuring our clients understand the basics of therapy and have appropriate expectations and action plans, taking time to listen to their needs is vital. As noted previously, compliance can be a significant barrier to patient care. Compliance starts with our clients andensuring the medication schedule fits their lives. Basic pharmacology principles dictate that medications only work if they are actually given to the patient. This mantra serves as the foundation for how I approach seizure therapy as a combination of art and science. "The Art of Seizure Therapy" is perhaps one of my favorite presentation topics because it recognizes that there are more factors to selecting a medication than just the seizures themselves. This lens allows us to consider the client's emotions, threshold for side effects, and daily schedule. Brace yourself: I am going to answer the most popular question neurologists get when it comes to seizure therapy, but you will not like the answer. So, what is the best seizure medication? My answer is "the one your patient needs." Please hold your tomatoes and pitchforks for just a moment. For example, when I have clients who make it clear to me that they can't do multiple dosings in a day or are honest and say they are going to struggle to remember to give medication multiple times per day, I will often reach for potassium bromide as my first-line therapy (in dogs only). I always discuss the pros and cons of each therapy option, noting that potassium bromide can be given once a day and is very forgiving for those owners who just aren't as compliant.

There are, of course, times when I tell clients that we don't have a choice when it comes to themedications we can use, but each case should be truly considered on a case-by-case basis. All therapy options have the right time and place.I am often criticized because I may "scare" owners out of utilizing certain medications,
but sometimes, client education should be scary because it is honest. However, preparing ownersfor medication side effects and understanding what is temporary or what to look out for in the long term is essential to catch things early and set expectations for owners in the early stages where side effects are more common. Being honest and upfront allows them to understand and manage their expectations and emotions when they encounter the side effects and mentally prepares them appropriately. In addition to side effects, which often get marquee headlining in our conversations, being aware of the cost of monitoring various medications should also be discussed. We cannot ignore that monitoring phenobarbital appropriately is more expensive than monitoring levetiracetam or potassium bromide. While none are free when done via textbook methods, there are variations in frequency, costs, etc., between these medications. Another example is of a college student who once brought their pet to me. They wanted a medication that had no side effects, didn't have to be given frequently, was cheap, and didn't require a lot of back and forth to the veterinarian. We had a serious conversation about having an epileptic dog and that what they were requesting didn't exist. We settled on a minimal workup with blood work, potassium bromide as a therapeutic, and a recheck in three months. Ultimately, this was the best plan for this situation, and it ended up working out very well for that pet andtheir owner.

By approaching seizures as a combination of art and science, working to understand the needs of our clients as well as the pets, and ensuring owners are educated about the fundamental aspects of seizure therapy, we can build the best chance for a positive outcome and support the most critical member of our patient's health care team – the pet owner.

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Disclosures:

Dr. Ryan Gibson is the Founder/Owner of Petparenteducators.com

LATEST SCIENTIFIC STUDIES ON CANINE EPILEPSY

Enhancing Canine Epilepsy Understanding: Tools and Techniques

Epilepsy stands as a prevalent neurological challenge in dogs, necessitating a comprehensive understanding of associated behaviors for optimal care and management. Similar to humans, dogs grappling with epilepsy often manifest behavioral comorbidities, such as heightened fear, anxiety, and aggression, as reported by their caregivers. However, the intricate nature of canine behavior, particularly the differentiation of interictal, pre and postictal behaviors, prodromal changes, and seizure-precipitating factors, presents significant hurdles for researchers.
In a recent exploration led by Emily Folkard, Lee Niel, Luis Gaitero, and Fiona May Kier James, the nuances of canine behavior in epilepsy take center stage. Published in Frontiers in Veterinary Science, the article scrutinizes the limitations and potentials of three pivotal tools in investigating these behaviors: questionnaires, electroencephalography (EEG), and actigraphy.

The study underscores the challenge of under-recognizing absence and focal seizures, complicating behavioral assessments in dogs contending with epilepsy. The intricate behavioral dynamics, coupled with the complexities of caring for an epileptic animal, exert a considerable impact on both the dog's and the caregiver's quality of life.

Tools at a Glance: Questionnaires, EEG, and Actigraphy

Questionnaires:

Traditional tools for gathering information about a dog's behavior, questionnaires, while common, carry the challenge of subjective caregiver responses and potential biases. The review acknowledges their utility in capturing specific behavioral aspects but stresses the need for more objective measures.

Electroencephalography (EEG):

A robust tool recording brain activity, EEG offers insights into seizure activity and related changes. While invaluable for understanding neurological aspects, EEG may fall short in capturing the complete spectrum of behavioral changes. The review proposes combining EEG with other methods for a more holistic understanding.

Actigraphy:

Monitoring a dog's movements to assess activity patterns, actigraphy yields valuable data on behavioral changes. The review highlights actigraphy's potential in capturing subtle alterations in behavior, especially during pre and postictal periods.

A Comprehensive Approach for Deeper Insights

The narrative review emphasizes the necessity of a prospective combination of these tools to enhance the objective classification and quantification of canine behavior in epilepsy. By capitalizing on the strengths of questionnaires, EEG, and actigraphy, researchers can overcome the limitations of individual methods, paving the way for a more holistic understanding of behavioral comorbidities linked to canine epilepsy.
In conclusion, this study sheds light on the challenges inherent in studying canine epilepsy behaviors and underscores the potential of a multidimensional approach. As our comprehension of these behaviors advances, it not only deepens our knowledge but also opens avenues for enhancing the quality of life for dogs grappling with epilepsy and their dedicated caregivers.

READ STUDY

Exploring Cannabidiol as Adjunct Treatment for Drug-Resistant Idiopathic Epilepsy in Dogs: A Comprehensive Study

Epilepsy remains a challenging condition in dogs, with approximately 30% exhibiting resistance to conventional antiseizure drugs (ASDs). Recent studies have ignited interest in cannabidiol (CBD) as a potential anticonvulsant for dogs with idiopathic epilepsy (IE). This double-blinded crossover study delves into the efficacy and safety of CBD as an adjunct treatment for 51 dogs facing drug-resistant IE.

The primary objective was to assess the impact of adding CBD to existing ASDs on seizure frequency. Additionally, the study aimed to meticulously report any adverse events associated with CBD administration. The study included 51 dogs meeting the criteria of experiencing at least 2 seizures per month while receiving at least one ASD.

Conducted as a double-blinded placebo-controlled crossover study, the research initially employed a 5 mg/kg/day dosage, meeting futility requirements after 12 dogs. Subsequently, a 9 mg/kg/day dosage was applied to the remaining 39 dogs. Dogs were randomly assigned to receive either CBD or a placebo for 3 months, with a 1-month washout period between treatments. Seizure frequency and adverse events were diligently recorded, and diagnostic testing was periodically performed throughout the trial.

At the 9 mg/kg/day dosage, a significant decrease in total seizure frequency was observed compared to the placebo group. Dogs receiving CBD exhibited a noteworthy 24.1% reduction in seizure days, while those in the placebo group experienced a 5.8% increase ($P \leq .05$). Although no significant difference emerged in the number of responders showing a ≥50% decrease in seizures, liver enzyme activities increased at both dosages. Notably, decreased appetite and vomiting were more prevalent during the CBD phase ($P \leq .05$).

Administering CBD at 9 mg/kg/day resulted in a significant decrease in total seizures and seizure days compared to the placebo group. However, close monitoring of liver enzymes is essential when using CBD in dogs, and clinicians should be attentive to potential side effects such as decreased appetite and vomiting. This study contributes valuable insights into the potential of CBD as an adjunct therapy for drug-resistant idiopathic epilepsy in dogs.

READ STUDY

Exploring Optimal Duration of Anesthetic Infusion for Canine Cluster Seizures and Status Epilepticus

Cluster seizures (CS) and status epilepticus (SE) in canines pose significant challenges, requiring effective therapeutic interventions when standard benzodiazepines prove non-responsive. Constant rate infusion (CRI) of benzodiazepines or propofol (PPF) emerges as a viable option, yet the lack of specific guidelines regarding the optimal duration of CRI remains a gap in current veterinary practice. This study endeavors to shed light on the impact of anesthetic CRI duration on outcomes and the length of hospital stay for dogs experiencing refractory seizure activity of diverse etiology.

Conducted as an open-label non-randomized clinical trial, the study enrolled 73 client-owned dogs. The participants were divided into two groups: the experimental (EXP) group, receiving diazepam (DZP) or PPF CRI for 12 hours, and the control (CTRL) group, receiving CRI for 24 hours. Both groups followed an identical emergency treatment protocol. Outcomes were categorized as favorable or poor based on predefined criteria, and univariate statistical analysis was performed.

Of the 73 dogs, 45 (62%) received DZP CRI, and 28 (38%) received PPF CRI. No statistically significant difference in outcomes was observed between the EXP and CTRL groups. The median length of stay was comparable at 56 hours for the ALL EXP group and 58.5 hours for the ALL CTRL group (p = 0.8).

While a shorter duration of DZP or PPF CRI did not correlate with a worsened outcome, the study did not establish a definitive superiority of shorter CRI duration in terms of outcomes or hospital stay length. The findings emphasize the complexity of managing refractory seizure activity in dogs, urging further research to delineate optimal therapeutic strategies for improved patient care. This study contributes valuable insights into the nuanced considerations surrounding anesthetic CRI duration for canine cluster seizures and status epilepticus.

READ STUDY

Exploring the Relationship Between Puppyhood Dietary Fat Sources and Adult-Onset Epilepsy

Epilepsy stands as a prevalent neurological concern in dogs, with a notable proportion of cases demonstrating unsatisfactory control despite the availability of various antiepileptic drugs. This study delves into the potential link between dietary fat sources provided during puppyhood and the occurrence of epilepsy in adulthood among Finnish companion dogs.

Conducted as a nested case-control study, data were extracted from the validated DogRisk food frequency questionnaire (DogRisk FFQ), encompassing feeding habits, disease history, and background information. The study involved 108 owner-reported epileptic cases matched with 397 non-epileptic controls based on key confounding factors—sex, breed, and age. Cox regression analysis was employed to scrutinize associations between puppyhood feeding practices and the onset of owner-reported epilepsy, considering 55 different food variables.

The study revealed a noteworthy inverse association between feeding fish fat from dietary sources at least once a week during puppyhood and epilepsy in adulthood. In unadjusted analysis, the odds ratio (OR) was 0.46 (95% CI 0.25-0.83, p=0.01). Adjusting for keeping conditions and dog characteristics maintained significance [OR 0.45 (95% CI 0.23-0.88), p=0.02], while further adjustment for additional feeding factors rendered the association of similar magnitude but non-significant [OR 0.56 (95% CI 0.27-1.15), p=0.12].

The findings suggest a potential protective association between dietary sources of fish fat during puppyhood and the development of epilepsy in adulthood. However, the results may be influenced by other feeding factors, warranting cautious interpretation. Aligning with existing knowledge on the role of omega-3 fatty acids and ketogenic diets in epilepsy management, this study lays the groundwork for future dietary intervention studies to validate and elucidate these observed associations.

READ STUDY

Unveiling Seizure-Precipitating Factors in Border Collies with Idiopathic Epilepsy: A Compilation of Noteworthy Narratives

Epilepsy remains a prevalent chronic neurological condition in dogs, significantly impacting the well-being of both canine companions and their owners. Seizure-precipitating factors (SPFs), also known as "triggers" or "provocative factors," have been extensively studied in both human and canine idiopathic epilepsy. Stress, hormones, sleep deprivation, and weather variations are documented SPFs in dogs. The Border Collie (BC) breed, predisposed to idiopathic epilepsy, often experiences unfavorable outcomes. Recognized for their sensitivity and strong connection with owners, BCs may have stress levels influenced by these dynamics. This article delves into six unrelated BCs with idiopathic epilepsy, highlighting distinctive SPFs and demonstrating how targeted management strategies led to improved outcomes.

In this compilation, each BC showcased unique SPFs that, when identified and addressed, positively influenced their epilepsy prognosis. Intriguingly, the triggers varied widely among the dogs and included factors such as the presence of another family dog, intellectual challenges, interactions with an autistic child, exposure to a bustling street, the nature of the owner relationship, and activities like ball throwing at the beach. These cases underscore the pivotal role of recognizing specific SPFs and implementing strategic management approaches, showcasing a potential reduction in seizure frequency or even achieving seizure freedom.

These anecdotes offer valuable insights into the diverse nature and impact of SPFs in Border Collies with idiopathic epilepsy. By unraveling these triggers and tailoring management practices accordingly, veterinarians and owners can potentially enhance the overall well-being and seizure outcomes of affected dogs within this predisposed breed.

READ STUDY

Exploring the Efficacy and Safety of KBroVet-CA1 in Canine Epilepsy: Lessons from a Retrospective Pilot Study

In the pursuit of convenient and effective treatments for idiopathic epilepsy in dogs, KBroVet-CA1 emerges as a breakthrough solution. Boasting a once-a-day dosing regimen, a long half-life ensuring continuous coverage even if a dose is missed, and palatable flavoring, KBroVet-CA1 offers unparalleled convenience for pet owners. However, its efficacy as a monotherapy warrants closer examination. To address this, a retrospective pilot study was conducted to evaluate the efficacy and safety profile of KBroVet-CA1 in managing canine epilepsy.

Methodology Overview:

The retrospective study enrolled 51 dogs diagnosed with idiopathic epilepsy, with researchers rigorously assessing the safety and efficacy of KBroVet-CA1. Over a 60-day period following the initiation of KBr therapy, clinical findings and treatment outcomes were meticulously documented.

Outcome Measures:

Researchers utilized predefined criteria to gauge treatment effectiveness, comparing pre-treatment and steady-state dosing parameters. Success was defined based on reductions in seizure counts, seizure event days per month, and seizure severity scores. Achieving a "success" status in all three variables constituted an overall treatment success.

Key Findings:

Of the initial 51 cases, 27 met the criteria for effectiveness data analysis. Notably, KBroVet-CA1 demonstrated an overall treatment success rate of 67%. Specific findings revealed that 70% of cases exhibited a decrease in seizure counts, 67% showed a reduction in seizure event days or remained stable, and 93% experienced improvements in seizure severity scores or no change, highlighting the drug's efficacy in mitigating seizure severity.

This study provides valuable insights into the efficacy and safety profile of KBroVet-CA1 as a monotherapy option, in addition to an adjunct therapy, for idiopathic epilepsy in dogs. With promising results, KBroVet-CA1 holds potential as both a mono-treatment and adjunctive therapy for managing this challenging neurological condition.

DATA ON FILE

Efficacy and Safety Profile of KBroVet-CA1 in Canine Epilepsy:

A Retrospective Pilot StudyOutcome Measures:

70%
Seizure Count Reduction:

67%
Decrease in Seizure Event Days or Stability:

93%
Improvement in Seizure Severity Scores or No Change:

Key Findings

67%
Overall Treatment Success Rate:

27 out of 51
Cases Meeting Criteria for Effectiveness Analysis:

Conclusion:

KBroVet-CA1 demonstrates potential as both a standalone and supplementary treatment for idiopathic epilepsy in dogs.

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About the authors:

Dr. Gaemia Tracy

Gaemia Tracy, DVM, DACVIM (Neurology) was born and raised in Pittsburgh, PA and graduated from Penn Hills Senior High School. Dr. Tracy attended The University of Pennsylvania and graduated in 2008 with a Bachelor of Arts (Biology) degree. While there, he played baseball and Sprint Football. He attended The Ohio State University School of Veterinary Medicine from 2008-2012. Immediately after graduating veterinary school, Dr. Tracy completed a rotating small animal medicine and surgery internship at Carolina Veterinary Specialists in Charlotte, NC. Dr. Tracy then completed a Neurology and Neurosurgery residency in Jacksonville, FL at North Florida Neurology with Dr. Andrew Hopkins and Dr. John Meeks as his mentors.
Dr. Tracy's professional interests include IVDD, spinal surgery, management of seizures and inflammatory diseases of the brain and spinal cord.

Dr. Richard Joseph

With over 30 years of expertise as a board certified veterinary neurology specialist, Dr. Richard Joseph is a trailblazer in neurology. Dedicated to empowering fellow vets, he envisions a landscape where every veterinarian is equipped to diagnose and treat patients often overlooked. As the driving force behind Veterinary TeleSpecialty with VOCN, Dr. Joseph ensures coast-to-coast access to advanced expertise for optimal care recommendations. Learn more at VOCN.org.

Dr. Rebecca Windsor

Dr. Rebecca Windsor graduated from the University of Southern California in 2001 with a degree in Psychobiology. She then attended the University of California, Davis where she earned her Doctor of Veterinary Medicine degree in 2005. Following her graduation from veterinary school, Dr. Windsor completed a yearlong internship in small animal medicine and surgery at North Carolina State University. She then completed a three-year residency in neurology and neurosurgery at the University of California, Davis and became board certified in 2009. Dr. Windsor has worked in private practices in the Washington DC and San Francisco Bay areas and Chicago before joining Wheat Ridge Animal Hospital in May of 2017.Dr. Windsor has a special interest in complex neurosurgical procedures such as brain and spinal cord tumor removal and skull and spinal fracture repair.

Dr. Ryan Gibson

Ryan Gibson, DVM, DACVIM (Neurology) is a member of the Anatomy, Physiology, and Pharmacology Team within Auburn's College of Veterinary Medicine and currently teaches within the Microanatomy (Histology) and Neuroscience courses.
Dr. Gibson has a rich interest in neurology/neuroscience and veterinary/higher education pedagogy. After working in private practice, Dr. Gibson returned to academia to focus on his passion for teaching and supporting students both inside and outside of the classroom. He is a strong proponent of mental health initiatives.
Dr. Gibson completed his undergraduate work at the University of Findlay in 2012 with focuses in Biology, Animal Science, and Pre-Veterinary medicine. In 2016 he completed his DVM with Mississippi State University followed by a small-animal rotating internship at The Ohio State University. Following his internship, he completed a private practice specialty internship in neurology/neurosurgery with Gulf Coast Veterinary Specialists in Houston, Texas followed by his residency at Mississippi State University. He became a Board-Certified Diplomate of the American College of Veterinary Internal Medicine – Neurology in 2021. He continues to serve veterinary patients though general practitioner support platforms.
Outside of veterinary medicine Dr. Gibson enjoys camping, boating, reading, and is a supporter of the performing arts. His dog Bogart has been with him since the first semester of vet school and was the first patient he ever did a neurological exam on during a first-year lab – Bogart was adopted immediately following the lab and has been with Dr. Gibson ever since.

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